Elora Sands/Keating Lands

Preliminary Stormwater Management Strategy Report

Project Location:
Township of Centre Wellington, Ontario

Prepared for:
Elora Sands Development Inc.
c/o Cachet Developments
2555 Meadowpine Boulevard, Unit 3
Mississauga, ON L5N 6C3

Prepared by:
MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

Issued: February 2025
Submitted: March 2025

MTE File No.: 49878-100

Contents

1.0 Introduction 1
1.1 Overview 1
1.2 Background Information 3
1.2.1 Excerpts from the Ontario Provincial Planning Statement 2024 3
1.2.2 Nichol Drain Subwatershed Study 4
1.2.3 Queen Street Creek (Irvine Creek Tributary) 4
1.2.4 County of Wellington Official Plan 4
1.2.5 Other Studies 5
2.0 Existing Conditions 6
2.1 Topographical Information 6
2.2 Geotechnical and Hydrogeological Information 6
2.3 Source Water Protection and GRCA Mapping 7
2.4 Hydrology 7
2.4.1 Pre-Development Drainage Conditions (Subject Lands) 8
3.0 Concept Development Plan 12
4.0 Concept Grading Plan 13
4.1 Grading Considerations 13
5.0 Stormwater Management Strategy 15
5.1 Objectives 15
5.1.1 Stormwater Management Criteria 15
5.2 Post-Development Conditions 17
6.0 Stormwater Management Strategy Impact Assessment 19
6.1 Hydrologic Modelling 19
6.2 Water Quality 19
6.3 Water Quantity 25
6.3.1 Nichol Drain Subwatershed Study Results 25
6.3.2 Updated Nichol Drain Subwatershed Study Results 26
6.4 Thermal Mitigation 28
6.4.1 Lot-Level Infiltration 28
6.4.2 SWMF Bottom Draw Outlet 28
6.4.3 Landscape Design of the SWMF 28
6.5 Water Balance Assessments 29
6.5.1 Infiltration 29
6.5.2 Overall Surface Water Flow Inputs to the Nichol Drain 29

6.5.3 Surface Water Balance to Wetland Upstream of the Queen Street Creek 32
6.6 Erosion Assessment 32
7.0 Floodplain Mapping 33
7.1 Nichol Drain No. 1 Floodplain Mapping 33
8.0 Conclusions 34

Figures

Figure 1.1 – Location Plan 2
Figure 2.1 – NDSS Catchment Areas (NDSS) 9
Figure 2.2 – Existing Conditions Drainage Area Plan 10
Figure 2.3 – Current Conditions Drainage Area Plan 11
Figure 4.1 – Preliminary Road Grade Plan 14
Figure 5.1 – SWM Post-Development Catchment Areas 18
Figure 6.1 – Proposed Conditions Drainage Area Plan 20
Figure 6.2 – SWMF1 Concept Plan 21
Figure 6.3 – SWMF2 Concept Plan 22
Figure 6.4 – SWMF3a Concept Plan 23
Figure 6.5 – SWMF3b Concept Plan 24

Tables

Table 6.1 – Peak Flow Estimates (NDSS 2008) 25
Table 6.2 – Peak Flow Estimates (MTE Updated) 27
Table 6.3 – Summary of 100yr Detention Volume Requirements 28
Table 6.4 – Water Balance for Nichol Drain Subwatershed 29
Table 6.5 – Summary of Annual Surface Water Volume Inputs to the Nichol Drain 30
Table 6.6 – Summary of Annual Runoff Increases 31
Table 6.7 – Change in Groundwater Water Balance to the Nichol Drain 31
Table 6.8 – Surface Water Balance to Wetland Upstream of the QSC 32

Appendices

Appendix A Tables
Appendix B Concept Plans (MGP)
Appendix C County of Wellington Official Plan Schedule A1
Appendix D Geotechnical and Hydrogeological Investigations
Appendix E Source Water Protection Plan Mapping (GRCA)
Appendix F Stormwater Management

Drawings

Existing Conditions Plan (Elora Sands/Keating Lands)
MTE Drawing No. 49878-100-EC2.1 .....Encl.

1.0 INTRODUCTION

1.1 Overview

MTE Consultants Inc. (MTE) was retained by Elora Sands Development Inc. to prepare the following Preliminary Stormwater Management Strategy Report (PSWMSR) in support of a privately initiated settlement boundary expansion Official Plan Amendment (OPA) application.

The lands that comprise the OPA application are known as the Elora Sands (formerly Gibson Farm) and the Keating Lands (owned by James Keating Construction). The Elora Sands are located at 7581 Sideroad 15, legally described as Lot 16 of Concession 12, Nichol Township, County of Wellington, and are approximately 40.0ha. The Keating Lands are located at 6583 Irvine Street, legally described as Lot 17 of Concession 12, Nichol Township, County of Wellington, and are approximately 36.8ha. These lands, herein referred to as the 'subject lands', are in the geographic community of Salem and both immediately adjacent to the current settlement boundary for Elora. The subject lands comprise a total area of approximately 76.8ha. Refer to **Figure 1.1** which illustrates the location of the subject lands.

The subject lands are generally bounded by Sideroad 15 to the north, Gerrie Road to the east, existing residential and future development (Ainley Farm Subdivision 23T-18002, owned by Keating) to the south, and Irvine Street to the west. The Nichol Municipal Drain No. 1 (ND) bisects the subject lands. Further west of Irvine Street is the Clayton Subdivision (23T-22005, owned by Cachet Development).

The Ainley Farm Subdivision is within the current settlement boundary and has recently received draft plan approval (November 14, 2023) and is proceeding to final design. The Clayton Subdivision is within the current settlement boundary and for which a Zoning By-law Amendment and Draft Plan of Subdivision applications were submitted and is currently under appeal and going through Ontario Land Tribunal mediation.

Concept Plans for the proposed development were prepared by Malone Given Parsons Ltd. (MGP) for the subject lands and form the basis for this PSWMSR. Refer to the Concept Plans, dated February 28, 2025, in **Appendix B**.

The purpose of this report is to present a Stormwater Management Strategy for the Concept Plan to support the privately initiated settlement boundary expansion.

This report should be read in conjunction with the *Elora Sands/Keating Lands – Functional Servicing Report*, prepared by MTE (March 2025).

SETTLEMENT BOUNDARY

IRVINE STREET

WOOLWICH STREET EAST

SIDEROAD 15

GERRIE ROAD

SIDEROAD 15

CLAYTON SUBDIVISION

ELORA SANDS

NICHOL DRAIN NO.1

KEATING LANDS

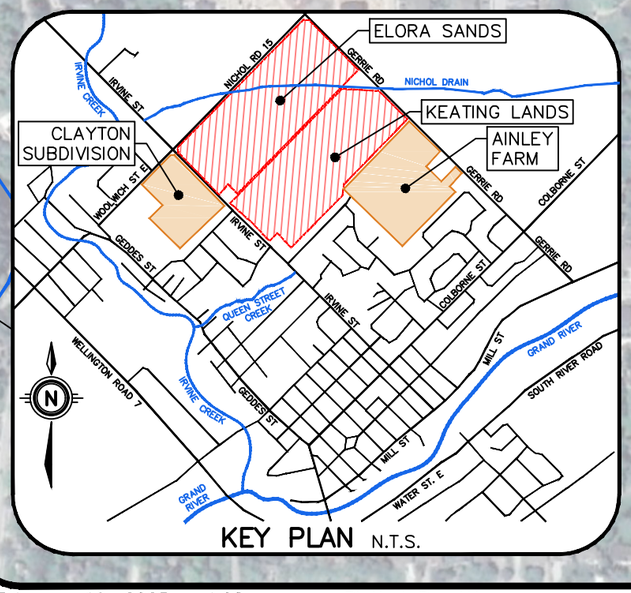
GERRIE ROAD

IRVINE STREET

WALSER STREET

AINLEY FARM SUBDIVISION (LANDS OWNED BY KEATING)

SETTLEMENT BOUNDARY



KEY PLAN N.T.S.

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
LOCATION PLAN

Drawn AXH	Scale	Figure **1.1**
Checked MXF	Project No. 49878-100	
Date (yyyy-mm-dd) 2025-01-28	Rev No. 0	

February 19, 2025 — 4:08 p.m. — Plotted By: AHewson

P:\P\49878\100\49878-100-F1.dwg

1.2 Background Information

1.2.1 Excerpts from the Ontario Provincial Planning Statement 2024

The Ontario Provincial Planning Statement (PPS) 2024 outlines province-wide direction and regulation on land use planning and development within Ontario. This section outlines key statements and excerpts from the PPS that provide the basis for the Stormwater Management strategies presented in this report.

Chapter 4: Wise Use and Management of Resources

4.2 Water

1. *Planning authorities shall protect, improve or restore the quality and quantity of water by:*
    a. *using the watershed as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development.*
    b. *minimizing potential negative impacts, including cross-jurisdictional and cross-watershed impacts.*
    c. *identifying water resource systems.*
    d. *maintaining linkages and functions of water resource systems.*
    e. *implementing necessary restrictions on development and site alteration to:*
        i. *protect all municipal drinking water supplies and designated vulnerable areas; and*
        ii. *protect, improve or restore vulnerable surface and ground water, and their hydrologic functions.*
    f. *planning for efficient and sustainable use of water resources, through practices for water conservation and sustaining water quality.*
    g. *ensuring consideration of environmental lake capacity, where applicable.*
2. *Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or restored, which may require mitigative measures and/or alternative development approaches.*
3. *Municipalities are encouraged to undertake, and large and fast-growing municipalities shall undertake watershed planning to inform planning for sewage and water services and stormwater management, including low impact development, and the protection, improvement or restoration of the quality and quantity of water.*
4. *Despite policy 4.2.3, where planning is conducted by an upper-tier municipality that includes one or more lower-tier large and fast-growing municipalities, the upper-tier municipality shall undertake watershed planning in partnership with lower-tier municipalities, including lower-tier large and fast-growing municipalities.*
5. *All municipalities undertaking watershed planning are encouraged to collaborate with applicable conservation authorities.*

1.2.2 Nichol Drain Subwatershed Study

A subwatershed study for the ND was undertaken by the Township of Centre Wellington and is detailed in the *Nichol Drain Subwatershed Study, Phase 1 Existing Conditions - Final Report* (NDSS) prepared by Aquafor Beech Limited (October 2008). This study was approved in June 2010. Based on the NDSS, the drainage area of the subwatershed encompasses an area of approximately 767ha, mostly of agricultural lands. The NDSS identified the ND as being a coldwater watercourse downstream of Sideroad 15 (without coldwater fish species) and a warmwater system upstream. However, the Grand River Conservation Authority's (GRCA) GRIN mapping shows the entire reach of the ND as being a warmwater system.

The ND is an open channel type municipal drain that starts adjacent to Beatty Line, at its most upstream point. The channel flows west approximately 4km and discharges to Irvine Creek immediately west of Irvine Street, which in-turn discharging to the Grand River just downstream of the Town of Elora.

Through the implementation of a stormwater management strategy for the subject lands, updates to the subwatershed study flow targets will be assessed. The updates to the NDSS will consider the subject lands as developed where the previous study did not contemplate any development beyond developments within Fergus. Pre and post-development flows were established for the ND through the NDSS. Later in this report, the flows in the ND are updated from the NDSS for development of the subject lands to demonstrate alignment with the previously approved subwatershed study objectives.

1.2.3 Queen Street Creek (Irvine Creek Tributary)

The Queen Street Creek (QSC) flows through urban, residential lots southwest of the subject lands, with an outlet to Irvine Creek west of Geddes Street. The QSC drainage area is almost entirely built out except for the southwest corner of the Keating Lands. This drainage area within the Keating Lands first drains to a wetland along Irvine Street, before discharging to the QSC.

Drainage to this tributary under post-development conditions is not subject to an approved subwatershed study. Site specific controls may need to be implemented to limit both flow and volumes while maintaining a surface water balance to the existing wetland feature.

1.2.4 County of Wellington Official Plan

As shown within Schedule A-1 – Land Use Plan of the Official Plan (**Appendix C**), the subject lands are not currently designated as residential but are immediately adjacent to the current settlement boundary. As such, the owners of the subject lands are submitting applications for a settlement boundary expansion request to provide housing in the County of Wellington (County) with the overall objective of providing more housing which is aligned with the Provincial Goal of 1.5 million homes built in Ontario by 2031.

The subject lands are considered potential future development lands in the context of this report.

1.2.5 Other Studies

The following studies represent background studies completed by the broader study team:

- *Environmental Impact Study, Elora Sands and Keating Lands, Township of Centre Wellington (Beacon Environmental, February 2025).*
- *Hydrogeological Considerations (HC-SM), Proposed Residential Development Elora Sands and Keating Lands, Elora (Soil-Mat, February 28, 2025).*
- *Source Water Protection Due Diligence Review, Elora Sands, 7581 Sideroad 15 (SR15), and Keating Lands (Part of Lot 17, Concession 12), Salem (Elora), ON (Terra-Dynamics Inc., March 6, 2025).*
- *Nichol Drain and Queen Street Creek, Preliminary Fluvial Geomorphological Assessment, Elora Sands and Keating Lands, Township of Centre Wellington (GEO Morphix, February 2025).*

2.0 EXISTING CONDITIONS

2.1 Topographical Information

The subject lands are generally comprised of rolling agricultural land. A topographical survey was completed for the Elora Sands property by MTE in 2022. A topographical survey of the Keating Lands has not yet been completed and as such the topography for Keating presented in the existing conditions plans is extracted from digital terrain information from the GRCA.

A topographic survey for the Clayton Subdivision was completed by JD Barnes (formerly Black, Shoemaker, Robinson & Donaldson Limited) in the Fall of 2021, as part of its draft plan of subdivision application.

The existing topography of the subject lands are shown on **MTE Drawing 49878-100-EC2.1**.

The subject lands generally consist of moderately sloped topography with slopes typically ranging from 1.0% to 12.5%. Existing elevations within the lands range from approximately 400.8m in the ND to 420.5m at the north corner of the lands.

The subject lands have a topographical ridge which extends through the Elora Sands and Keating lands, generally parallel to the ND. The southwest corner of the subject lands drains from the ridge (from northwest to southeast) to a wetland located in the southwest corner, adjacent to Irvine Street. The wetland and Irvine Street drain to the QSC.

2.2 Geotechnical and Hydrogeological Information

In October 2021, Soil-Mat Engineers & Consultants Ltd. (Soil-Mat) prepared two geotechnical and hydrogeological investigations for the Clayton Subdivision and the Elora Sands development. The fieldwork for the investigations included: 4 boreholes, 3 of which included monitoring wells for the Clayton Subdivision and an additional 7 boreholes, of which 1 included a monitoring well for the Elora Sands. The boreholes were advanced to depths ranging between 2.1 to 7.6m. In March 2022, Soil-Mat prepared additional preliminary hydrogeological considerations for the Clayton Subdivision and the Elora Sands.

A supplementary hydrogeological assessment was completed by Soil-Mat dated July 20, 2022 for the Clayton Subdivision and the Elora Sands, advancing 14 additional boreholes, 12 of which included monitoring wells drilled in February and April 2022. The additional boreholes were advanced to depths ranging between 3.0 to 8.2m. This assessment included groundwater levels in all monitoring wells. Levels were measured from February to June 2022. An updated groundwater contour plan was also provided to supplement the groundwater contours establish within the original March 2022 hydrogeological report.

In August 2024, a supplemental groundwater data summary was completed by Soil-Mat to provide updated groundwater monitoring data. Based on this summary, groundwater levels were slightly higher as compared to previous monitored levels.

A Hydrogeological Considerations for the subject lands (Elora Sands and Keating Lands) was prepared by Soil-Mat dated February 2025. Detailed field investigation on the Keating Lands to confirm conclusions from the Hydrogeological Considerations is recommended to be completed at a later date to support detailed design.

Based on the results of the previous detailed investigations, the subsurface stratigraphy for the subject lands is generally described as topsoil underlain by sandy silt, silty sand till, and clayey sandy silt till deposits, with generally trace amounts of gravel. Based on the groundwater level readings recorded by Soil-Mat and extrapolation for the Keating Lands, groundwater levels

generally rise and fall with the topography. Groundwater flow is interpreted as having a high point located near the topographical ridge. The groundwater flow generally mimics the surface water flow direction. Based on the findings in the NDSS and the hydrogeological assessment by Soil-Mat, generally groundwater contributes to the ND as shallow interflow and baseflow. The wetland in the southwest corner of the subject lands is generally characterized as being supplied by precipitation and surface water runoff with a slight vertical downward gradient to shallow groundwater.

The geotechnical and hydrogeological reports can be found in **Appendix D**.

2.3 Source Water Protection and GRCA Mapping

The subject lands are within a Wellhead Protection Area (WHPA) and a Significant Groundwater Recharge Area-Tier 2 (SGRA) as defined by the Source Water Protection Plan Mapping, as illustrated in **Appendix E**. A majority of the lands have a WHPA classification of WHPA-C, while the southwestern portion of the lands have a classification of WHPA-B and the eastern portion of the lands have a classification of WHPA-D. The majority of the subject lands are within a wellhead vulnerability score of 6 with a small portion in the southwest corner having a vulnerability score of 8 and the eastern portion of the lands with a vulnerability of 4. There is an existing municipal drinking water supply well located on Aqua Street approximately 550m south of the subject lands.

The intrinsic vulnerability for the SGRA is characterised as moderate (generally having a vulnerability score of 4), generally indicative of shallow groundwater flow towards Irvine Creek west of the subject lands.

As part of the Hydrogeological Considerations, Terra-Dynamics Inc. conducted a Source Water Protection Due Diligence Review of the subject lands dated March 2025. The management strategies proposed for mitigation of impacts for quality and quantity to WHPAs and SGRAs by Terra-Dynamics aligns with the stormwater management strategies and servicing proposed in the Functional Servicing Report and this Preliminary Stormwater Management Strategy Report. Refer to **Appendix D and E** for details.

2.4 Hydrology

An existing conditions hydrologic model was developed as part of the Nichol Drain Subwatershed Study using the SWMHYMO hydrologic model platform. A future conditions model was also prepared to assess impact of the secondary plan area that was being considered as part of the subwatershed study. Both the existing and future conditions were modelled for the:

- 2, 5, 10, 25, 50 and 100-year return period rainfall events (4hr Chicago distribution) utilizing the Fergus Shand Dam Intensity-Duration-Frequency (IDF) parameters.
- Regional storm event (212mm depth, last 12 hours of Hurricane Hazel and AMC III conditions).

Summarized in **Table 6.1** are the estimated peak flows for the 2-year through 100-year events and the Region storm event at various locations within the Nichol Drain subwatershed for existing and future conditions.

2.4.1 Pre-Development Drainage Conditions (Subject Lands)

Approximately 72% of the subject lands (56.9ha) located in the northeast drains to the ND, which in-turn drains to Irvine Creek. Approximately 28% of the subject lands (22.7ha) located in the southwest drains to the Queen Street Creek which also drains to Irvine Creek.

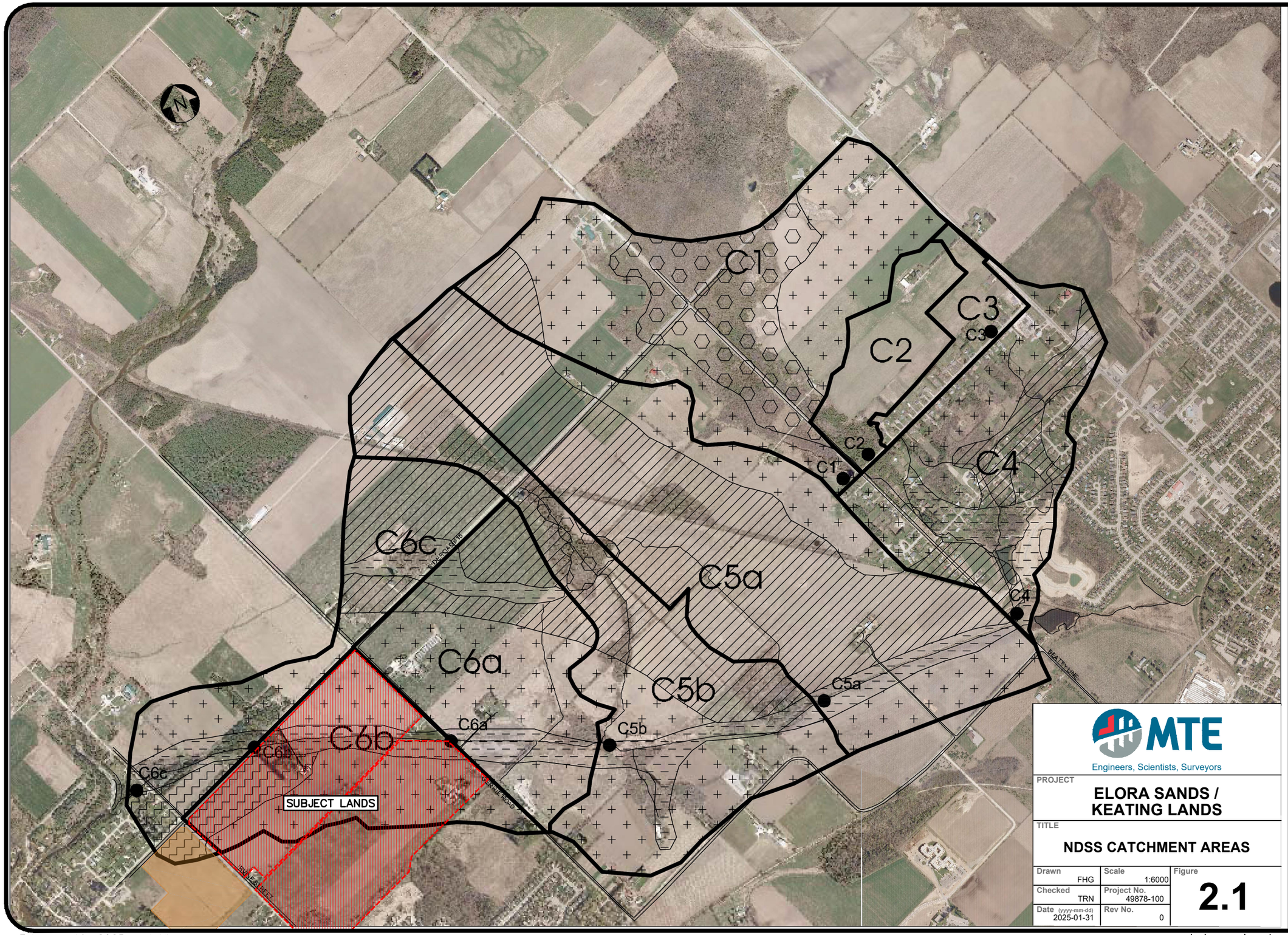
Refer to **Figure 2.1** for Upstream Drainage Areas documented in the NDSS.

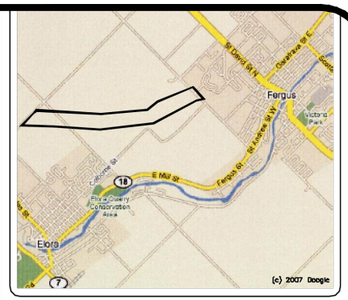
Refer to **Figure 2.2** for the existing conditions drainage area plan which documents updates based on current topography. Refer to **Figure 2.3** for the current conditions drainage area plan which documents current conditions including upstream areas that have been approved for development since the NDSS.

The existing conditions catchments for the subject lands can be summarized as follows:

- Sub-catchment 622 - Surface runoff from the northeast corner flows from northeast to southwest and directly into the ND. A future Stormwater Management Facility (SWMF) will be in 622 at the downstream end of the ND.
- Sub-catchments 621 and 623 - Surface runoff from the subject lands flows from south to north directly into the ND.
- Sub-catchment 624 - Surface runoff from the subject lands flows from southwest to northeast and into the south ditch of Sideroad 15 or directly into the ND.
- The Sideroad 15 ditch, which originates west of Irvine Street receiving flows from the Clayton Subdivision (625) and existing external roads (626), conveys flows northeasterly across Irvine Street via a culvert to the ND.
- The development of the Clayton Subdivision proposes an interim SWMF to be located where the future SWMF would be located in 624 at the downstream end of the ND to service 621, 623, 624, 625 and 626. Sub-catchment 625 was updated from the original NDSS as part of this report based on current site-specific topography.
- Sub-catchment 709 - Surface runoff from the subject lands flows from the ridge in the northeast to the wetland (706) located in the southwest, then onto Irvine Street which outlets to the QSC.

Please refer to **Tables A2, A.3, A.4** and **A.6** (**Appendix A**) for the pre-development parameters from the NDSS and the modified catchments/parameters used in this report.





LEGEND

- SUBCATCHMENT
- FLOW NODE

SOIL TYPE

- LISTOWEL LOAM
- HARRISTON LOAM
- MUCK
- PARKHILL LOAM
- BRANT

No.	By	Date	Revison	Chk'd

Aquafor Beech limited

ENGINEER

FLUVIAL GEOMORPHOLOGIST

CLIENT:
TOWNSHIP OF
CENTRE WELLINGTON

PROJECT:
NICHOL DRAIN
SUB WATERSHED STUDY

TITLE:
FIGURE 3
SOIL MAP

Scale: 1:15,000
Date: FEB. 2008

File: L:\62645

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
NDSS CATCHMENT AREAS

Drawn	Scale	Figure
FHG	1:6000	**2.1**
Checked: TRN	Project No.: 49878-100	
Date (yyyy-mm-dd): 2025-01-31	Rev No.: 0	

February 19, 2025 — 4:11 p.m. — Plotted By: AHewson

P:\P\49878\100\49878-100-F10-NDSS-CATCHMENT.dwg

CAD: P:\P\49878\100\49878-100-F13 PRE D.DWG

Plot Date: March 5, 2025 – 2:56 PM

IRVINE CREEK

WOOLWICH STREET EAST

SIDEROAD 15

NICHOL DRAIN

GERRIE ROAD

BEATTY LINE

HIGHWAY 6

IRVINE STREET

QUEEN STREET CREEK

COLBORNE STREET

GRAND RIVER

SALEM PUBLIC SCHOOL

CLAYTON SUBDIVISION

ELORA SANDS

ELORA MEADOWS SUBDIVISION

KEATING LANDS

AINLEY FARM SUBDIVISION

EX. BONAIRE HIGHLANDS SUBDIVISION (MODELED AS POST DEVELOPMENT)

EX.STORYBROOK SUBDIVISION (MODELED AS POST DEVELOPMENT)

803	5.32ha	
802	11.61ha	
639	4.60ha	
636	3.32ha	
638	20.63ha	
637	8.36ha	
630	33.04ha	
804	4.51ha	
801	0.53ha	
625	1.06ha	
624	11.84ha	
627	9.39ha	
622	9.69ha	
806	10.60ha	
625	6.72ha	
805	3.53ha	
707	1.69ha	
623	19.37ha	
610	78.13ha	
510	91.44ha	
100	136.98ha	
813	4.88ha	
712	14.67ha	
708	3.50ha	
706	1.54ha	
709	21.19ha	
621	6.56ha	
714	1.54ha	
711	5.75ha	
710	17.91ha	
620	7.48ha	
200	27.50ha	
300	17.14ha	
516	10.78ha	
514	2.65ha	
520	108.36ha	
511	52.87ha	
515	5.01ha	
513	6.68ha	
512	27.13ha	
400	82.86ha	
517	1.75ha	

LEGEND

- EXISTING GRCA CONTOURS (526)
- EXISTING DRAINAGE DIRECTION
- PRE-EXISTING DEVELOPMENT CATCHMENT
- CATCHMENT NUMBER (A=101)
- CATCHMENT AREA (ha) (4.59ha)
- SUBJECT LANDS SITE BOUNDARY
- AGRICULTURAL
- OPEN SPACE
- EXTERNAL DEVELOPMENT
- BUILT BOUNDARY
- SUBJECT LANDS

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
EXISTING CONDITIONS DRAINAGE AREA PLAN

Drawn	TJD	Scale	1:6000
Checked	TRN	Project No.	49878-100
Date (yyyy-mm-dd)	2024-12-16	Rev No.	0

Figure **2.2**

CAD: P:\PW\49878\100\49878-100-F13 PRE CURR.DWG

Plot Date: March 6, 2025 - 9:30 AM

IRVINE CREEK

803 5.32ha

802 11.61ha

639 4.60ha

638 20.63ha

636 3.32ha

637 8.36ha

630 33.04ha

WOOLWICH STREET EAST

NICHOL DRAIN

SIDEROAD 15

SIDEROAD 15

804 4.51ha

SALEM PUBLIC SCHOOL

801 0.53ha

626 1.06ha

624 11.84ha

627 9.39ha

622 9.69ha

625 6.72ha

CLAYTON SUBDIVISION

ELORA SANDS

GERRIE ROAD

610 78.13ha

510 91.44ha

100 136.98ha

BEATTY LINE

HIGHWAY 6

806 10.60ha

805 3.53ha

707 1.69ha

623 19.37ha

IRVINE CREEK

ELORA MEADOWS SUBDIVISION

708 3.50ha

706 1.54ha

709 21.19ha

KEATING LANDS

621 6.56ha

813 4.88ha

712 14.67ha

714 1.54ha

711 5.75ha

620 4.15ha

IRVINE STREET

710 17.91ha

AINLEY FARM SUBDIVISION

200 27.50ha

EX. BONAIRE HIGHLANDS SUBDIVISION (MODELED AS POST DEVELOPMENT)

300 17.14ha

516 10.78ha

QUEEN STREET CREEK

520 108.36ha

NICHOL DRAIN

511 55.52ha

515 5.01ha

EX.STORYBROOK SUBDIVISION (MODELED AS POST DEVELOPMENT)

400 82.86ha

513 6.68ha

512 27.13ha

COLBORNE STREET

518 6.44ha

COLBORNE STREET

517 2.14ha

GRAND RIVER

LEGEND

- EXISTING GRCA CONTOURS (526)
- EXISTING DRAINAGE DIRECTION
- PRE-EXISTING DEVELOPMENT CATCHMENT
- CATCHMENT NUMBER (No.100)
- CATCHMENT AREA (ha) (4.56ha)
- SUBJECT LANDS SITE BOUNDARY
- AGRICULTURAL
- OPEN SPACE
- EXTERNAL DEVELOPMENT
- BUILT BOUNDARY
- SUBJECT LANDS

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
CURRENT CONDITIONS DRAINAGE AREA PLAN

Drawn	TJD	Scale	1:6000
Checked	TRN	Project No.	49878-100
Date (yyyy-mm-dd)	2024-12-16	Rev No.	0

Figure **2.3**

3.0 CONCEPT DEVELOPMENT PLAN

The Concept Plans (**Appendix B**) for this potential residential development comprises the following:

- Low and Medium density residential lands.
- Park block.
- Three (3) Stormwater Management Facility Blocks.
- One (1) Sanitary Pumping Station (SPS) Block.
- Municipal Right-of-Ways.

The implementation of the concept plan of low and medium density development would result in a growth population of approximately 4,300 people (approximately 1,300 units).

The SWM strategy for the subject lands includes three SWMF's. Two of these facilities are located in the northeast portion of the development outletting to the ND, and the third is located in the southwest portion of the development adjacent to the wetland feature, which outlets to the QSC.

4.0 CONCEPT GRADING PLAN

4.1 Grading Considerations

Refer to **Figure 4.1** – Preliminary Road Grade Plan for the subject lands.

The following is a list of considerations which influenced and/or governed the Concept grading design of the subject lands:

- Match centreline elevations of existing and proposed road grades;
- Match boundary grades around the perimeter of the subject lands;
- Match grades at Natural Heritage System buffer limits
- Ensure major storm event overland flows are directed towards the proposed SWMFs;
- Comply with municipal standards for minimum and maximum road and landscaped area grades;
- Ensure adequate cover is feasible, over municipal services;
- Manage the cut/fill balance for the concept development to the extent possible at this time; and,
- Maintain 0.30m vertical separation from underside of footing to seasonal high groundwater levels.

Preliminary centreline road grades ranging from 0.5% (minimum) to 6% were used to complete the concept grading design. The other considerations listed above were incorporated into the overall concept grading design.

CAD: P:\P\49878\100\49878-100-FIG.DWG

Plot Date: March 5, 2025 - 2:43 PM

WOOLWICH STREET EAST

SIDEROAD 15

BRICKER AVENUE

IRVINE STREET

GERRIE ROAD

EXISTING AGRICULTURAL

CLAYTON SUBDIVISION

ELORA SANDS

KEATING LANDS

ELORA MEADOWS SUBDIVISION

AINLEY FARM SUBDIVISION

EXISTING RESIDENTIAL

WALSER STREET

NICHOL DRAIN No.1

REGULATORY FLOODPLAIN

APPROXIMATE FLOODPLAIN (FROM NICHOL DRAIN SUBWATERSHED STUDY PHASE 1 EXISTING CONDITIONS FINAL REPORT)

STREET 1

STREET 2

STREET 3

STREET 4

STREET 5

STREET 6

STREET 7

STREET 8

STREET 9

STREET 10

STREET 11

STREET 12

STREET 13

SWMF 1
PP=404.0

SWMF 2
PP=405.0

SWMF 3
PP=410.5

MATCH INTO PROPOSED GRADING OF AINLEY FARM SUBDIVISION

MATCH INTO EXISTING GERRIE ROAD GRADING

MM305 SOIL-MAT (FEB, 2022)

BH307 SOIL-MAT (FEB, 2022) (APPROXIMATE LOCATION)

BH306 SOIL-MAT (FEB, 2022) (APPROXIMATE LOCATION)

LEGEND

- PROPERTY BOUNDARY
- SUBJECT LANDS
- PROPOSED CONTOURS (CLAYTON SUBDIVISION)
- EXISTING CONTOURS
- GRCA CONTOURS
- (415.35) PROPOSED ELEVATION
- LP LOW POINT
- HP HIGH POINT
- OVERLAND FLOW ROUTE (MAJOR STORM)
- EXISTING DIRECTION OF DRAINAGE

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
PRELIMINARY ROAD GRADE PLAN

Drawn	ACH	Scale	1:1500
Checked	MXF	Project No.	49878-100
Date (yyyy-mm-dd)	2025-01-30	Rev No.	0

Figure **4.1**

5.0 STORMWATER MANAGEMENT STRATEGY

The objective of this stormwater management plan is to ensure that the concept development includes the necessary measures to protect the hydrology, hydrogeology, and water quality of the receiving water systems, significant surface water and groundwater features.

Furthermore, the plan ensures that the Concept Plan provides the necessary stormwater management measures to comply with the NDSS mitigating impacts to ND and to mitigate impacts to the QSC.

5.1 Objectives

The primary objectives of the stormwater management strategy are as follows:

- Document criteria for the management of stormwater runoff from the subject lands.
- Recommend a comprehensive plan for controlling the quality and quantity of storm water runoff from the subject lands in accordance with the PPS.
- Provide erosion protection for the ND and the QSC.
- Provide thermal mitigation for storm water discharged to the ND.
- Provide chloride impacts to the wetland feature upstream of the QSC.
- Consider climate change and convey Regional storm flows to an appropriate outlet.
- Prepare conceptual designs for the proposed SWMF's.

5.1.1 Stormwater Management Criteria

New developments are required to provide stormwater management in accordance with provincial and municipal policies. Relevant documents have been referenced in the design of the stormwater management plan for the subject site; including:

- Stormwater Management Planning and Design Manual (MOE, 2003).
- GRCA Policies for the Administration of Ontario Regulation 41/24 (GRCA, 2024).
- Nichol Drain Subwatershed Study - Phase 1 Existing Conditions - Final Report (Aquafor Beech, 2008).

Based on the above policies and relevant documents, background reports, agency requirements, and site-specific considerations, the following SWM criteria have been established for this study area:

- **Water Quality** – Provide an Enhanced (MOE, 2003) level of stormwater quality treatment prior to discharge to the ND and the QSC.
- **Water Quantity** – Control the peak flow rates of existing catchment areas for all storms up to and including the 100-year storm event to the allowable flow rates prior to releasing the flows to the ND.
- **Instream Erosion Control** – Provide erosion protection through the extended detention of the 25mm storm event over a 48-hour period.
- **Thermal Mitigation** – Implement Low Impact Development (LID) measures and mitigation measures at SWMF outlets.

- **Water Balance - Infiltration** – Maintain or exceed pre-development groundwater volume inputs established within the NDSS through active and/or passive infiltration measures.
- **Water Balance - Surface Water Runoff** – Maintain or exceed pre-development surface water volume inputs into significant environmental features.
- **Chloride Mitigation –** minimize chloride impacts to the wetland feature upstream of the QSC.

Water Quality Control

The NDSS required that an *Enhanced Level* of water quality control be provided to protect the potential coldwater fish habitat of the ND. The requirements for this level of quality control are established in Table 3.2 of the *Stormwater Management Planning and Design Manual* (MOE, 2003). Similarly, provide an Enhanced Level of water quality control prior to discharging to the QSC.

Quantity Control to ND and QSC

The SWMFs for the subject lands will maintain post-development peak flow release rates at pre-development levels for all storms up to and including the 100-year storm event, as well as provide a sufficient outlet to convey the Regional event to the ND and the QSC.

Instream Erosion Control

The NDSS documented that the reaches of the ND upstream of Sideroad 15 were stable and reaches downstream of Sideroad 15 were moderately stable with no existing erosion sites in need of remedial action. The NDSS also concluded that erosion stress should be minimized as a result of hydrologic changes. Management strategies implemented within the watershed for erosion have been through the extended detention of the 25mm storm event runoff volume over a 24 to 48 hour period.

It should be noted that erosion control for the North West Fergus Secondary Plan Area was provided utilizing this same strategy.

GEO Morphix's future report intends to confirm the criteria of the proposed strategy through a detailed erosion assessment.

Thermal Mitigation

Implement thermal mitigation using at-source lot-level infiltration, and bottom draws and cooling trenches at end-of-pipe SWMF's.

Water Balance - Infiltration

Low Impact Design (LID) best management practices to be used to mimic pre-development recharge rates.

Water Balance – Surface Water Runoff

The wetland upstream of the QSC is a surface water fed feature (410.5m) recharging to the shallow water table (410.0m) which has a ditch inlet outlet along Irvine Street at elevation 409.5m. The wetland is not a closed depression and is a "flow through" wetland.

A surface water runoff analysis for the wetland upstream of the QSC should be assessed.

Chloride Mitigation

Chlorides can be harmful to wetland vegetation and therefore to protect the wetland upstream of the QSC, it is recommended to implement a winter bypass which may reduce runoff volumes from December 1st to April 1st.

5.2 Post-Development Conditions

The proposed SWM strategy requires the implementation of wet pond stormwater management ponds designed to accommodate storm water runoff from the majority of the subject lands. The proposed development plans for the subject lands are comprised of residential land uses, municipal road rights-of-way, a park block and walkway blocks.

Three SWMF blocks are proposed for the subject lands. Two of these facilities are located near the ND, and the third is located in the southwest corner adjacent to the wetland. The proposed SWM scheme receives drainage from the development and right-of-way lands as follows:

- SWMF1 – 57.65ha
- SWMF2 – 8.95ha
- SWMF3 – 10.71ha

The location of the proposed SWMFs, along with contributing drainage areas, is illustrated in **Figure 5.1**. SWMF3 considered an alternate location situated adjacent to Irvine Street to provide a more suitable outlet location. SWMF3a represents the current location in the southwest corner and SWMF3b represents the alternate location against Irvine Street. Both SWMF concepts generally have the same design parameters.

Minor system runoff from the contributing areas will be conveyed through the proposed storm sewer system and overland flow routes to the SWMFs. Roof areas for all units, where possible, will be directed to lot-level infiltration galleries prior to any overflow being directed to the SWMFs. Excess runoff from the major storms will flow overland to the SWMFs via the proposed rights-of-way and designated overland flow routes.

Under post-development conditions, the subject lands were delineated into several catchments. Refer to **Tables A.5** and **A.7** which provide a brief description of the catchment areas as well as the design parameters used in the hydrologic modelling from the NDSS, as well as the current hydrologic modelling.

A detailed copy of the post-development catchment parameters and modelling output logs have been included in **Appendix F**.

CAD: P:\P\49878\100\49878-100-F16 POST D.DWG

Plot Date: March 5, 2025 - 3:00 PM

802
11.61ha

639
4.47ha

636
3.60ha

637
8.45ha

630
33.04ha

EXISTING RESIDENTIAL

WOOLWICH STREET EAST

SIDEROAD 1

SALEM PUBLIC SCHOOL

SALEM PUBLIC SCHOOL

STREET 2

IRVINE STREET

9625
8.07ha

8625
4.11ha

9628
5.35ha

627
9.39ha

NICHOL DRAIN No.1

9622
6.75ha

8622
2.20ha

STREET 13

GERRIE ROAD

9805
1.30ha

EXISTING RESIDENTIAL

CLAYTON SUBDIVISION

8624
4.32ha

9624
8.46ha

ELORA SANDS

STREET 5

STREET 4

9623
4.42ha

610
78.33ha

EXISTING RESIDENTIAL

9707
0.12ha

BRICKER AVENUE

STREET 1

8623
2.05ha

STREET 8

KEATING LANDS

STREET 11

8709
3.51ha

8621
4.69ha

9621
16.18ha

ELORA MEADOWS SUBDIVISION

STUMPF STREET

CLEGG ROAD

MARR DRIVE

708
3.63ha

STREET 3

STREET 6

STREET 12

STREET 9

706
1.62ha

10m WOODLAND BUFFER

WOODLAND LIMIT

TOP OF BANK (SILTFENCE)

WETLAND LIMIT (SILTFENCE)

WETLAND LIMIT (BEACON)

WOODLAND LIMIT (BEACON)

TOP OF BANK (BEACON)

9709
7.20ha

GERRIE ROAD

9622.1
0.61ha

712
14.67ha

DRIVE

STREET 10

STREET 7

WALSER STREET

620
4.15ha

711
5.75ha

QUEEN STREET CREEK

710
18.09ha

WALSER STREET

AINLEY FARM SUBDIVISION

LEGEND

- PROPERTY BOUNDARY
- SUBJECT LANDS
- EXISTING CONTOURS (GRCA)
- EXISTING CONTOURS
- POST-DEVELOPMENT CATCHMENT
- APPROXIMATE FLOODPLAIN LIMIT (FROM NDSS)
- OVERLAND FLOW ROUTE
- 1000 / 1.10 — CATCHMENT No. / AREA (Ha)

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN

Drawn	TJD	Scale	1:2000
Checked	TRN	Project No.	49878-100
Date (yyyy-mm-dd)	2024-12-16	Rev No.	0

Figure **5.1**

6.0 STORMWATER MANAGEMENT STRATEGY IMPACT ASSESSMENT

6.1 Hydrologic Modelling

Three conditions were modelled being: existing conditions, current conditions, and proposed conditions (post-development), using the Visual OTTHYMO (VO) modelling software, to reflect the detailed drainage conditions for the subject lands. This allows for a quantitative estimate of flows under the pre and post-development conditions. All three scenarios were modelled for the following rainfall conditions:

- Quality storm event (25mm depth, 4-hour Chicago distribution).
- 2, 5, 10, 25, 50, and 100-year return period rainfall events (4-hour Chicago distribution) utilizing the Fergus Shand Dam IDF parameters.
- Regional storm event (212mm depth, last 12 hours of Hurricane Hazel and AMC III conditions).
- 30-year continuous simulation period (1995 to 2024 meteorological data set derived from the Fergus Shand Dam station).

Refer to **Figure 6.1** for the proposed conditions drainage area plan.

The IDF parameters, hydrologic parameters, and model output files for each of the pre- and post-development catchment areas are provided in **Appendix F**.

6.2 Water Quality

The SWMFs have been designed as wet ponds with a permanent pool depth of 1.5m. These facilities will incorporate a sediment forebay with a depth of 1.5m which offers the benefits of dilution and settling of sediment. Refer to **Tables A.8, A.9 and A.10** for details of the SWMFs.

The SWMFs have been sized to provide an enhanced level of protection. According to Table 3.2 from the MOE's 2003 stormwater management guidelines, SWMF1 and SWMF2 require 213m^3/ha of storage (60% imperviousness) and SWMF3 requires 226m^3/ha of storage (70% imperviousness).

A planting scheme should be prepared that carefully selects plant species and their location in and around the basins to stabilize banks, mitigate temperature increases, deter waterfowl from nesting within the area, and provide aesthetics and safety benefits.

Refer to the following figures for the schematic concept plans for SWMF1, SWMF2, and SWMF3a/3b.

CAD: P:\P\49878\100\49878-100-F13 PRE FUT.DWG

Plot Date: March 6, 2025 - 1:13 PM

IRVINE CREEK

WOOLWICH STREET EAST

SIDEROAD 15

NICHOL DRAIN

GERRIE ROAD

BEATTY LINE

HIGHWAY 6

IRVINE STREET

QUEEN STREET CREEK

COLBORNE STREET

GRAND RIVER

SALEM PUBLIC SCHOOL

CLAYTON SUBDIVISION

ELORA SANDS

ELORA MEADOWS SUBDIVISION

KEATING LANDS

AINLEY FARM SUBDIVISION

EX. BONAIRE HIGHLANDS SUBDIVISION (MODELED AS POST DEVELOPMENT)

EX.STORYBROOK SUBDIVISION (MODELED AS POST DEVELOPMENT)

803	5.32ha	
802	11.61ha	
639	4.44ha	
636	3.32ha	
638	20.63ha	
637	8.36ha	
630	33.04ha	
804	4.51ha	
8625	4.11ha	
9625	8.07ha	
806	10.60ha	
8624	4.32ha	
9624	8.46ha	
627	9.39ha	
9628	5.35ha	
9622	6.75ha	
8622	2.20ha	
610	78.13ha	
510	91.44ha	
100	136.98ha	
813	4.88ha	
712	14.67ha	
708	3.50ha	
9623	4.42ha	
8623	2.05ha	
8709	3.51ha	
9621	16.18ha	
8621	4.69ha	
9709	7.20ha	
714	1.54ha	
711	5.75ha	
710	17.91ha	
620	4.15ha	
520	108.36ha	
516	10.78ha	
511	55.52ha	
515	5.01ha	
513	6.68ha	
512	27.13ha	
518	6.44ha	
517	2.14ha	
200	27.50ha	
300	17.14ha	
400	82.86ha	

LEGEND

- EXISTING GRCA CONTOURS (526)
- EXISTING DRAINAGE DIRECTION
- PRE-EXISTING DEVELOPMENT CATCHMENT
- CATCHMENT NUMBER (No-101) / CATCHMENT AREA (ha) (###)
- SUBJECT LANDS SITE BOUNDARY
- AGRICULTURAL
- OPEN SPACE
- EXTERNAL DEVELOPMENT
- BUILT BOUNDARY
- SUBJECT LANDS

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
PROPOSED CONDITIONS DRAINAGE AREA PLAN

Drawn: TJD	Scale: 1:6000	Figure: **6.1**
Checked: TRN	Project No.: 49878-100	
Date: yyyy-mm-dd 2024-12-16	Rev No.: 0	

CAD: P:\P\49878\100\49878-100-F9.2-SWM1.DWG

Plot Date: February 25, 2025 - 1:39 PM

SIDEROAD 15

NICHOL DRAIN No. 1

SWMF OUTLET TO ND1

SWMF INLET

APPROXIMATE FLOODPLAIN (FROM NICHOL DRAIN SUBWATERSHED STUDY PHASE 1 EXISTING CONDITIONS FINAL REPORT)

MAIN CELL

FOREBAY

FOREBAY WEIR ELEV=404.00

PERMANENT POOL ELEV=404.00

4m MAINTENANCE ACCESS

STREET FIVE

STREET TWO

0 12.5 25 37.5 50m

LEGEND

- SWM BLOCK BOUNDARY
- APPROXIMATE FLOODPLAIN LIMIT (FROM NDSS)
- NICHOL DRAIN No. 1
- PERMANENT POOL
- 25mm STORM LEVEL
- 100yr STORM LEVEL
- PROPOSED SWMF INLET/OUTLET
- 326 EXISTING CONTOURS
- (405.70) PROPOSED SPOT ELEVATIONS
- 3:1 PROPOSED EMBANKMENT
- ACCESS ROAD

MTE

Engineers, Scientists, Surveyors

PROJECT

ELORA SANDS / KEATING LANDS

TITLE

STORMWATER MANAGEMENT FACILITY 1

Drawn	Scale	Figure
AXH	1:1,250	6.2
Checked: MXF	Project No.: 49878-100	
Date (yyyy-mm-dd): 2025-01-28	Rev No.: 0	

CAD: P:\P\49878\100\49878-100-F9.3-SWM2.DWG

LEGEND

- SWM BLOCK BOUNDARY
- APPROXIMATE FLOODPLAIN LIMIT (FROM NDSS)
- NICHOL DRAIN No. 1
- PERMANENT POOL
- 25mm STORM LEVEL
- 100yr STORM LEVEL
- PROPOSED SWMF INLET/OUTLET
- 326 — EXISTING CONTOURS
- (405.70) — PROPOSED SPOT ELEVATIONS
- 3:1 — PROPOSED EMBANKMENT
- ACCESS ROAD

SIDEROAD 15

STREET THIRTEEN

N

(414.66)

(411.52)

(410.85)

FOREBAY WEIR
ELEV=405.00

(405.60)

(405.50)

(403.50)

FOREBAY

MAIN CELL

(403.50)

(408.11)

(406.59)

(406.80)

(406.80)

(406.88)

(406.88)

(404.90)

(405.01)

(408.01)

SWMF INLET

PERMANENT POOL
ELEV=405.00

4m MAINTENANCE ACCESS

APPROXIMATE FLOODPLAIN
(FROM NICHOL DRAIN SUBWATERSHED STUDY PHASE 1 EXISTING CONDITIONS FINAL REPORT)

SWMF OUTLET
TO ND1

NICHOL DRAIN No. 1

0 7.5 15 22.5 30m

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
STORMWATER MANAGEMENT FACILITY 2

Drawn	Scale	Figure
AXH	1:750	6.3
Checked: MXF	Project No.: 49878-100	
Date (yyyy-mm-dd): 2025-01-28	Rev No.: 0	

Plot Date: February 25, 2025 - 1:39 PM

CAD: P:\P\49878\100\49878-100-F9.4-SWM3A.DWG

Plot Date: February 25, 2025 - 1:40 PM

LEGEND

- SWM BLOCK BOUNDARY
- PERMANENT POOL
- 25mm STORM LEVEL
- 100yr STORM LEVEL
- PROPOSED SWMF INLET/OUTLET
- 326 — EXISTING CONTOURS
- (405.70) — PROPOSED SPOT ELEVATIONS
- 3:1 — PROPOSED EMBANKMENT

IRVINE STREET

STREET SEVEN

STREE

WETLAND LIMIT (BEACON)

10m WETLAND BUFFER (BEACON)

WOODLAND LIMIT (BEACON)

10m WOODLAND BUFFER (BEACON)

SWMF INLET

FOREBAY

FOREBAY WEIR ELEV=410.50

MAIN CELL

SWMF OUTLET/ WINTER BYPASS TO QSC VIA IRVINE STREET

PERMANENT POOL ELEV=410.50

WALSER STREET

QUEEN STREET CREEK

0 10 20 30 40 50m

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS / KEATING LANDS

TITLE
STORMWATER MANAGEMENT FACILITY 3A

Drawn	Scale	Figure
AXH	1:1000	6.4
Checked: MXF	Project No.: 49878-100	
Date (yyyy-mm-dd): 2025-01-28	Rev No.: 0	

CAD: P:\P\49878\100\49878-100-F9.5-SWM3B.DWG

Plot Date: March 6, 2025 - 8:24 AM

LEGEND

- SWM BLOCK BOUNDARY
- PERMANENT POOL
- 25mm STORM LEVEL
- 100yr STORM LEVEL
- PROPOSED SWMF INLET/OUTLET
- 326 — EXISTING CONTOURS
- (405.70) — PROPOSED SPOT ELEVATIONS
- 3:1 — PROPOSED EMBANKMENT
- ACCESS ROAD

IRVINE STREET

SWMF OUTLET/ WINTER BYPASS TO QSC VIA IRVINE STREET

FOREBAY WEIR ELEV=410.50

MAIN CELL

FOREBAY

SWMF INLET

4m MAINTENANCE ACCESS

PERMANENT POOL ELEV=410.50

10m WOODLAND BUFFER

WOODLAND LIMIT

10m WETLAND BUFFER (BEACON)

WETLAND LIMIT (BEACON)

0 7.5 15 22.5 30m

CONTINUATION

Ex. EP

CONTINUATION

MARR STREET

WALSER STREET

QUEEN STREET CREEK

INSET SCALE:1:2000

Engineers, Scientists, Surveyors

PROJECT

ELORA SANDS / KEATING LANDS

TITLE

STORMWATER MANAGEMENT FACILITY 3B

Drawn	Scale	Figure
AXH	1:750	**6.5**
Checked	Project No.	
MXF	49878-100	
Date (yyyy-mm-dd)	Rev No.	
2025-01-28	0	

6.3 Water Quantity

An existing conditions hydrologic model was developed as part of the *Nichol Drain Subwatershed Study, Phase 1 Existing Conditions - Final Report* (Aquafor Beech Limited, October 2008) using the SWMHYMO hydrologic model platform. A future conditions model was also prepared to assess impacts of the North West Fergus Secondary Plan development. As part of this study, the hydrologic modelling (with Visual OTTHYMO) has been further revised to prepare 3 new models (revised existing conditions, current conditions, and future conditions incorporating the subject lands).

6.3.1 Nichol Drain Subwatershed Study Results

Based on the hydrologic modelling completed as part of the NDSS, peak flow rates for each catchment under existing conditions as well as future conditions for the North West Fergus Secondary Plan development were determined. Regional peak flows rates are uncontrolled. Refer to **Table 6.1** for the peak flows for each of the storm events.

Table 6.1 – Peak Flow Estimates (NDSS 2008)

Location	Drainage Area (ha)	Peak Flow Rate (m^3/s)						
		2yr	5yr	10yr	25yr	50yr	100yr	Regional
Nichol Drain – Existing Conditions								
C1	136.9	0.8	1.7	2.5	3.7	4.6	5.7	13.0
C2	168.7	1.0	2.2	3.2	4.7	5.9	7.2	15.9
C3	181.9	1.1	2.4	3.4	5.0	6.2	7.6	17.3
C4	263.0	1.8	4.0	5.9	8.6	10.9	13.3	26.0
C5a	443.0	2.8	6.1	8.8	12.6	15.9	19.1	41.7
C5b	563.0	3.5	7.7	11.1	15.9	20.1	24.3	53.3
C6a	640.1	3.7	8.4	12.2	17.3	21.7	26.2	58.4
C6b	700.6	4.0	8.9	13.0	18.4	22.9	27.7	62.6
C6c	767.1	4.3	9.7	14.2	20.1	24.9	30.0	68.8
Nichol Drain – Future Condition								
C1	136.9	0.8	1.7	2.5	3.7	4.6	5.7	13.0
C2	168.7	1.0	2.2	3.2	4.7	5.9	7.2	15.9
C3	181.9	1.1	2.4	3.4	5.0	6.2	7.6	17.3
C4	263.0	1.8	4.0	5.9	8.6	10.9	13.3	26.0
C5a	443.0	3.3	7.2	10.4	15.0	18.3	21.7	42.9
C5b	563.0	4.3	9.3	13.4	19.3	23.7	28.3	55.9
C6a	640.1	4.5	10.0	14.3	20.3	25.0	30.0	61.5
C6b	700.6	4.9	11.0	15.6	22.1	27.2	32.7	67.4
C6c	767.1	5.4	12.3	17.4	24.8	30.6	36.7	74.3

6.3.2 Updated Nichol Drain Subwatershed Study Results

Three hydrologic models were prepared to capture the existing conditions, current conditions and future conditions of the Nichol Drain subwatershed.

The **existing conditions model** generally follows the existing conditions model as presented in the *Nichol Drain Subwatershed Study, Phase 1 Existing Conditions - Final Report* (Aquafor Beech Limited, October 2008). In areas of detailed study (North West Fergus Secondary Plan and Ainley Farm Subdivision), catchment delineation was updated to reflect pre-development conditions as reported. The Elora Sands, Keating Lands, and Clayton Subdivision pre-development catchments were updated to reflect surveyed topographical information.

The **current conditions model** (generally mimicking **future conditions** modelling from the NDSS) considers the North West Fergus Secondary Plan Area and Ainley Farm Subdivision as being fully developed. Catchments and SWM controls were modelled as presented in their respective SWM reports. In this model, the subject lands and the Clayton Subdivision are modelled as pre-development.

The **proposed conditions model** updates the current conditions model with the subject lands and the Clayton Subdivision as developed representing the ultimate developed condition.

Utilized catchment parameters for the three scenarios can be found in **Appendix A**. The peak flows from the NDSS were subsequently updated using the updated hydrologic model scenarios created as part of this study. Under regional storm conditions, SWM controls were removed, and flows are modelled as uncontrolled. Refer to **Table 6.2**.

Based on our analysis, flows are generally reduced from those published in the approved NDSS as a result of the SWM strategy implemented.

Table 6.2 – Peak Flow Estimates (MTE Updated)

Location	Drainage Area (ha)	Peak Flow Rate (m^3/s)						
		2yr	5yr	10yr	25yr	50yr	100yr	Regional
Nichol drain – Updated Existing Conditions								
C1	137.0	0.8	1.8	2.5	3.7	4.5	5.5	13.3
C2	168.8	1.0	2.2	3.1	4.5	5.6	6.8	16.2
C3	182.0	1.1	2.3	3.3	4.8	5.9	7.1	17.6
C4	264.8	1.9	4.2	6.1	8.9	11.2	13.6	26.4
C5a	469.3	3.0	6.6	9.5	13.7	16.8	20.0	43.4
C5b	577.7	3.6	7.8	11.2	16.1	20.0	23.8	53.8
C6a	655.7	3.9	8.5	12.2	17.3	21.3	25.4	59.3
C6b	727.8	4.2	9.3	13.3	18.9	23.2	27.6	65.2
C6c	797.8	4.6	10.4	14.3	21.2	25.9	30.9	72.2
Nichol Drain – Current Conditions								
C1	137.0	0.8	1.8	2.5	3.7	4.5	5.5	13.3
C2	168.8	1.0	2.2	3.1	4.5	5.6	6.8	16.2
C3	182.0	1.1	2.3	3.3	4.8	5.9	7.1	17.6
C4	264.8	1.9	4.2	6.1	8.9	11.2	13.6	26.4
C5a	467.3	3.2	6.8	9.9	14.2	17.5	20.8	44.2
C5b	575.7	3.9	8.3	11.8	16.9	20.9	25.0	54.4
C6a	653.7	4.1	9.0	12.8	18.2	22.4	26.7	59.6
C6b	722.5	4.6	10.2	14.6	20.7	25.4	28.7	65.9
C6c	792.5	5.2	11.7	16.9	23.9	29.3	31.4	73.2
Nichol Drain – Proposed Conditions								
C1	137.0	0.8	1.8	2.5	3.7	4.5	5.5	13.3
C2	168.8	1.0	2.2	3.1	4.5	5.6	6.8	16.2
C3	182.0	1.1	2.3	3.3	4.8	5.9	7.1	17.6
C4	264.8	1.9	4.2	6.1	8.9	11.2	13.6	26.4
C5a	467.3	3.2	6.8	9.9	14.2	17.5	20.8	44.2
C5b	575.7	3.9	8.3	11.8	16.9	20.9	25.0	54.4
C6a	653.7	4.1	9.0	12.8	18.2	22.4	26.7	59.5
C6b	734.5	4.2	9.3	13.5	19.6	24.3	29.1	66.3
C6c	804.7	4.5	9.9	14.4	20.8	25.7	30.8	73.7

Table 6.3 summarizes the storage volume requirements within the SWMFs.

Table 6.3 – Summary of 100yr Detention Volume Requirements

Stormwater Management Facility	Volume Required for 100yr Storm Event (m^3)
SWMF1	27,083
SWMF2	3,155
SWMF3a or SWMF3b	4,277

6.4 Thermal Mitigation

Urbanization within any watershed will cause temperature increases in storm water runoff, picking up stored heat from asphalt and other impervious surfaces. Mitigation measures are required for coldwater creeks by implementing lot-level infiltration and end-of-pipe SWMF management of runoff from high frequency precipitation events prior to discharge to the receiving watercourse.

Since most of the annual rainfall occurs in high frequency storm events, as a best management practice the 25mm storm event was chosen for thermal mitigation as this event accounts for the majority of annual precipitation.

The following mitigation measures (lot level infiltration, bottom draws, and landscaping) have been proposed for the subject lands and will mitigate changes to the thermal regime downstream of Sideroad 15 in the ND.

6.4.1 Lot-Level Infiltration

The majority of the storm water runoff that is generated at the lot-level via roofs, will be effectively disconnected from the ND during all rain events up to a 25mm depth through the proposed lot-level infiltration galleries.

6.4.2 SWMF Bottom Draw Outlet

The outlet configuration of the SWMF will incorporate a reverse-sloped bottom draw pipe which will draw the coldest water from the bottom of the SWMF and discharge to the ND.

6.4.3 Landscape Design of the SWMF

A landscape design for the proposed SWMF will be completed during the final design stage of the development. The primary aspect of the landscape design is to address thermal mitigation and aesthetics with secondary aspects being, erosion protection, long term bank stability, and to limit pedestrian access into the permanent pool components. The facility will be designed in accordance with the Township's stormwater management policies and guidelines for aesthetics, landscaping, and safety of stormwater management facilities.

6.5 Water Balance Assessments

A water budget calculation was completed to assess potential hydrologic impacts the proposed development may have on the ND and the QSC wetland feature.

Annual precipitation for the subject lands was estimated to be approximately 974mm/year, based on data gathered at the Fergus Shand Dam weather station between 1995 and 2024.

Table 6.4 summarizes the water balance to the ND in a similar manner as the NDSS based on continuous modelling.

Table 6.4 – Water Balance for Nichol Drain Subwatershed

Water Budget Component (mm/year)	Pre-Development of Storybrook/Ainley/Subject Lands (Existing Conditions)	Post-Development of Storybrook and Ainley (Current Conditions)	Post-Development of Subject Lands (Proposed Conditions)
Precipitation	974	974	974
Evapotranspiration	493	470	447
Water Surplus by difference	**481**	**504**	**527**
Infiltration	206	201[1]	217[2]
Runoff	275	303	310

1. Storybrook development proposed at-source infiltration however the modelling did not reflect these LIDs.
2. The post-development model for the Storybrook development also does not include at-source infiltration LIDs.

6.5.1 Infiltration

Under pre-development conditions, infiltrated water for a large portion of the subject lands contributes to the shallow groundwater table, which from the ridge within the subject lands flows northerly towards the ND. The balance of the subject lands flows southwest from the ridge to the QSC.

6.5.2 Overall Surface Water Flow Inputs to the Nichol Drain

The water budget calculation was completed for the entire ND subwatershed.

Under post-development conditions, the water inputs to the ND will comprise of four components: the controlled surface discharge from the SWMFs, the uncontrolled surface runoff from the lands downstream of the SWMF (catchments 9621.1 and 627), surface discharge from the Ainley Subdivision (catchment 620) and the surface flows from all upstream lands in the subwatershed. Refer to **Tables 6.5** and **6.6** for summaries of annual surface water volume inputs to the Nichol Drain.

Table 6.5 – Summary of Annual Surface Water Volume Inputs to the Nichol Drain

General		Annual Volume (m^3/year)
Existing Conditions Surface Flow to ND	Surface Flow to ND (Drainage Areas 620-627 - 72.11ha)	193,518[1]
	Surface Flow to ND from upstream drainage areas (excluding Drainage Areas 620-627 upstream of C6b at SR15 in NDSS – 655.71ha)	1,822,874 [2]
	Total [1+2]	**2,016,392** [Pre]
Proposed Conditions Surface Flow to ND	Controlled Discharge from SWMF1 and 2 (Drainage Areas 9621-9625 & 8621-8625 - 66.6ha)	266,400 [3]
	Uncontrolled runoff (Drainage Areas 9621.1 & 627 – 10.0ha)	32,441 [4]
	External runoff (Drainage Areas 620* – 4.15ha)	24,111 [5]
	Total [3+4+5]	**311,952** [6]
	Surface flows to ND from upstream drainage areas (excluding Drainage Areas upstream of C6b at SR15 in NDSS – 652.83ha)	2,017,245 [7]
	Total [6+7]	**2,340,197** [8]
Increased Surface Flow to ND [8–Pre]		**323,805** [9]
Percentage of Increase [9/Pre]		**16.1%**

1. Split into additional catchments within model

Table 6.6 – Summary of Annual Runoff Increases

Stormwater Management Facility	Annual Runoff Volume at SR15 (m^3)	Percent Increase
Existing Conditions	2,016,392	-
Current Conditions	2,214,434	9.8% over EC
Proposed Conditions	2,340,197	5.7% over CC 16.1% over EC

Refer to **Table 6.7** for changes in groundwater input to the Nichol Drain subwatershed.

Table 6.7 – Change in Groundwater Water Balance to the Nichol Drain

Water Budget Component (mm/year)	Existing Conditions (agricultural)	Proposed Conditions (residential only)
Drainage Area - ha	72.1	80.8
Precipitation mm	974	974
Evapotranspiration mm	507	265
Water Surplus by difference mm	467	709
Passive Infiltration mm	198	121
Roof Gallery Infiltration mm	-	181
Runoff mm	268	408
Annual Infiltration m^3	143,095 (based 72.1ha)	217,451 (based on 72.1ha) or 243,505 (based on 80.8ha)

1. Precipitation and temperatures from on 1995-2024 data set from EC, PET determined from 1991-2010 climate normals using T&M process and then inputted into VO as maximum ET.

6.5.3 Surface Water Balance to Wetland Upstream of the Queen Street Creek

Table 6.8 below summarises existing conditions and post-development conditions water balance to the QSC wetland.

Table 6.8 – Surface Water Balance to Wetland Upstream of the QSC

Water Budget Component (mm/year)	Existing Conditions (agricultural)	Proposed Conditions (residential only)
Drainage Area - ha	21.2	10.7
Precipitation - mm	974	974
Evapotranspiration - mm	511	181
Water Surplus by difference - mm	463	793
Passive Infiltration - mm	210	96
Roof Gallery Infiltration - mm	-	297
Runoff - mm	251	401
Annual Runoff m^3 to wetland	53,187	42,947
Clean water collection system to wetland - m^3	0	11,000
Annual runoff to the wetland	53,187	53,947
Roof Infiltration (21.2ha) m^3	n/a	51,934
Passive Infiltration (21.2ha) m^3	44,499	20,342
Total Infiltration (21.2ha) m^3	44,499	72,276 (based on 21.2ha)

1. Precipitation and temperatures from on 1995-2024 data set from EC, PET determined from 1991-2010 climate normals using T&M process and then inputted into VO as maximum ET.

A winter bypass could be implemented for runoff discharging to the wetland feature upstream of the QSC to address chloride impacts. The surface water runoff volume deficit (as a result of bypassing flows during the winter months) could be offset by the implementation of additional roof water collection system outletting directly to the wetland.

6.6 Erosion Assessment

The MECP recommends that any newly proposed development throughout a watershed should implement a stormwater management solution that provides at least a 48-hour drawdown for the volume generated during the 25mm storm event, to ensure that erosion threshold flow durations do not exceed pre-development levels.

A Preliminary Fluvial Geomorphological Assessment (FGA) for the ND and the QSC was prepared by GEO Morphix, dated February 2025. The FGA provides a background review and desktop assessment of the ND and the QSC. The FGA is proposed to be updated based on field data collected in the Spring 2025.

7.0 FLOODPLAIN MAPPING

7.1 Nichol Drain No. 1 Floodplain Mapping

The NDSS made a recommendation to establish a proposed terraced natural floodplain channel. Based on this NDSS recommendation and consistent with the recommendations in the Environmental Impact Study dated February 2025 prepared by Beacon Environmental, it was recommended that a setback from each streambank of the ND be provided to encourage a more natural channel form including riparian vegetation. It was also recommended to reconnect the floodplain with the channel by terracing each side. This could be completed as part of the future development of the subject lands adjacent to the ND and is not required at this time. The floodplain mapping work completed to date considered both existing conditions and proposed conditions (i.e., terraced natural floodplain channel).

The floodplain analysis completed as part of the NDSS did not model the development of the subject lands. The subject lands are very small relative to the overall 767ha drainage area of ND. The subject lands are adjacent to the urban area and should have been included in the long-term floodplain mapping.

As part of the NDSS, a HEC-RAS model was prepared to determine the Regional Storm Floodlines for the Nichol Drain subwatershed. The model used the uncontrolled regional storm flows forecasted by the future conditions model, documented in **Table 6.1**. The uncontrolled regional flows from MTE's updated future conditions model, in **Table 6.2**, are reduced from the forecasted flows from the NDSS. As such, it is expected that no changes in the floodplain mapping lines are required at this time. A summary of the flows upstream and downstream of the subject lands can be found in **Table 7.1**.

Table 7.1 – Summary of Uncontrolled Regional Storm Flows

Nichol Drain Node	Location	NDSS Future Conditions (m^3/s)	Updated MTE Proposed Conditions (m^3/s)
C6a	Upstream of subject lands at Gerrie Road	61.5	59.5
C6b	Downstream of subject lands at SR 15	67.4	66.3
C6c	Upstream of ND confluence with Irvine Creek	74.3	73.7

8.0 CONCLUSIONS

The main findings of this report for the subject lands are:

1. The stormwater management strategy outlined within this report will provide the appropriate levels of quality, quantity, erosion, and water balance controls to meet the objectives of the *Nichol Drain Subwatershed Study, Phase 1 Existing Conditions - Final Report* (Aquafor Beech Limited, October 2008).
2. The stormwater management strategy outlined within this report, will provide appropriate level of quality, quantity and risk mitigation to adequately address the requirements of source water protection outlined in the Source Water Protection Due Diligence Review by Terra-Dynamics Inc.
3. Hydrologic modelling has been developed to establish the required flow controls for the stormwater management facilities.
4. Three stormwater management facilities have been proposed to service the subject lands. The proposed stormwater management facility blocks satisfy all the sizing criteria for peak flow, water quality and erosion control.
5. *Enhanced* quality control of stormwater runoff can be provided by the proposed stormwater management strategy through the implementation of SWMFs which include a forebay, and a wet pond cell.
6. Quantity control targets for post-development peak flows rates attenuation to pre-development levels that are directed to the ND can be achieved in the proposed SWMFs for all storm events up to and including the 100-year event.
7. Post-development instream erosion will be mitigated by the use of a minimum 24 to 48-hour extended detention of the 25mm storm event.
8. The SWMFs will be designed with measures to mitigate thermal impacts to the ND.
9. Lot-level infiltration of roof water for all storm events up to the 25mm event will also mitigate thermal impacts.
10. Infiltration (both active and passive) on the subject lands will provide an enhancement to the groundwater balance.
11. Chloride mitigation should be implemented through a winter bypass for the wetland feature upstream of the QSC.
12. Conveyance of the Regional storm flows through the SWMFs to the ND can be achieved.
13. The floodplain mapping within the subwatershed study is more conservative based on regional storm flow rates being less than those presented in the HECRAS modelling.
14. The stormwater management strategy proposed conforms to the Provincial Planning Statement (2024).

All of which is respectfully submitted,

MTE Consultants Inc.

Garett Korber, P.Eng.
Water Resources Engineer
519-743-6500 ext. 1292
gkorber@mte85.com

Jeff Martens, P.Eng.
Vice President – Land Development
519-743-6500 ext. 1231
jmartens@mte85.com

GMK:sgd

M:\49878\100\02 - Reports\MTE Reports\SWM\49878-100_rpt_2025-03-07_SWM Strategy_Final.docx

Appendix A

Tables

Table A.1 – Infrastructure Costs Included in Development Charges Calculation

Project No.	Increased Service Needs Attributable to Anticipated Development	Timing (Year)	Gross Capital Cost Estimate (2020$)	Comments
Roads				
1	Sideroad 15, Beatty Line N to Highway 6	2021-2023	1,950,000	Sideroad 15 improvements to connect to Highway 6
15	Sideroad 15, Gerrie Road to Beatty Line N	2024-2031	3,990,000	Sideroad 15 improvements to connect to Beatty Line and Project 1 Highway 6
16	Sideroad 15, James Street to Irvine Street	2024-2031	1,120,000	Sideroad 15 improvements from James Street to Irvine Street
33	Sideroad 15, Gerrie Road to Irvine Street	2024-2031	2,050,000	Sideroad 15 improvements to connect James through to Highway 6
17	Walser Street Ext E, Walser Street to Gerrie Road	2024-2031	1,560,000	Roadway improvements within Ainley subdivision with road stubs to the subject lands
19	Gerrie Road, Sideroad 15 to Walser Street Ext East	2024-2031	1,350,000	Roadway improvements adjacent to the Ainley subdivision
27	Gerrie Road, Walser Street Ext E to Colborne Street	2024-2031	1,220,000	Roadway improvements adjacent to the subject lands
68	Gerrie Road and Colborne Street	2024-2031	350,000	Intersection improvements south of the subject lands
New	Intersection improvements at Irvine Street Sideroad 15			Works contemplated to accommodate Clayton subdivision
New	Intersection improvements at Gerrie Road and Sideroad 15			Works contemplated to accommodate the subject lands
Wastewater – Sewers				
1	Colborne Sanitary Upsizing – Wilson to Irvine	2024	170,200	Trunk sewer improvements on Colborne near intersection of Irvine. Project should be extended to include Queen Street North trunk.
Water Facilities				
4	Replacement of F2 Well with additional capacity expanded	2022	1,795,000	
5	Replacement and expansion of F5 Well	2022	863,000	
1	New Well - Area #3	2023-2026	4,734,000	
2	New Well - Area #5	2028-2030	4,710,000	Well field immediately north of the subject lands
6	New Well - Area 7	2032-2040	3,608,000	
7	New Well - Area 8	2020-2037	6,721,000	
Water Distribution				
1	Gerrie Watermain Extension - Colborne to ER10 (North Limit)	2024	614,000	Watermain extension to Ainley subdivision northern limit and the southern limit of the subject lands.
2	Irvine Watermain Extension – Bricker to SR 15	2029	798,000	Watermain extension immediately adjacent to the subject lands on Irvine Street.
12	Woolwich Watermain Extension - Irvine to James	2028	436,000	Watermain extension immediately adjacent to the Clayton subdivision and a key supply at the northwest corner of the subject lands.
19	Irvine Watermain Extension - Woolwich to Well Area 5	2030	2,534,000	North connection to expanded water supply at Well 5
20	Sideroad 10(11) Watermain Extension - Irvine to Well Area 5	2030	691,000	Watermain extension along Irvine Street from Sideroad 15 then extending ~ 1km north to well area 5. Key water supply for the subject lands.
28	SDRD 15 Watermain Extension - Beatty Line to Well Area 7	2039	145,000	Future water supply for further growth and expansion.
Future	Sideroad 15 watermain from Gerrie Road to Beatty Line			Key connection for watermain transmission.

Table A.2 – Existing Conditions Soil Parameters (NDSS 2010)

Catchment	Area	Soils	Coverage (ha)	% Coverage	Soil Group	CN	Composite CN	
							AMC II	AMC III
Nichol Drain								
C1	136.9	Listowel loam Harriston loam Muck	9.0 81.2 46.2	7 59 34	BC BC B	71 71 66	69	85
C2	31.8	Based on Bonaire Hydrology Model						
C3	13.2	Based on Bonaire Hydrology Model						
C4	81.1	Listowel loam Harriston loam Muck Parkhill loam	22.9 41.1 2.7 14.4	28 51 3 18	BC BC B BC	71 71 66 71	71	85
C5a	180.3	Listowel loam Harriston loam Muck Parkhill loam	125.9. 25.8 9.1 19.4	70 14 5 11	BC BC B BC	71 71 66 71	71	86
C5b	120.0	Listowel loam Harriston loam Muck Parkhill loam	55.5 47.1 4.7 12.2	46 39 4 10	BC BC B BC	71 71 66 71	71	86
C6a	77.1	Listowel loam Harriston loam Parkhill loam	18.5 46.2 12.4	24 60 16	BC BC BC	71 71 71	71	86
C6b	60.5	Brant Harriston loam Parkhill loam	9.4 41.9 9.2	16 69 15	B BC BC	66 71 71	70	85
C6c	66.5	Brant Listowel loam Harriston loam Parkhill loam	9.3 25.6. 19.8 11.5	14 39 30 17	B BC BC BC	66 71 71 71	70	85

Table A.3 – Existing Condition Soil Parameters (MTE Updated)

SWS Catchment	VO Catchment #	Area	Composite CN	
			AMC II	AMC III
Nichol Drain				
C1	100	136.98	69	85
C2	200*	31.8	Based on Bonaire Hydrology Model	
C3	300*	13.2	Based on Bonaire Hydrology Model	
C4	400	82.86	71	85
C5a	500[1]	193.01	Based on North-West Fergus Secondary Plan Model	
C5b	520	108.36	71	86
C6a	610	78.05	71	86
C6b	620	4.55	70	85
	621	6.56	70	85
	622	9.69	70	85
	623	19.37	70	85
	624	11.84	70	85
	625	6.72	70	85
	626	1.06	70	85
	627	9.39	70	85
C6c	630	33.04	70	85
	636	3.32	70	85
	637	8.36	70	85
	638	20.63	70	85
	639	4.6	70	85

1. split into additional catchments within model

Table A.4 – Existing Conditions Catchment Parameters (NDSS 2010)

Catchment	Description	Area (ha)	% Impervious	Flow Length (m)	Slope (%)
To Nichol Drain No. 1					
C1	Rural/Woods	136.9	0	1736	0.3
C2	Based on Bonaire Hydrology Model				
C3	Based on Bonaire Hydrology Model				
C4	Low-density Residential	81.1	10	1437	0.7
C5a	Rural/Woods	180	0	2932	0.7
C5b	Rural/Woods	120	0	2649	0.8
C6a	Rural/Woods	77.1	0	1080	1.1
C6b	Rural/Woods	60.5	0	1052	2.0
C6c	Rural/Woods	66.5	0	1067	2.3

Table A.5 – Post-Development Catchment Parameters (NDSS 2010)

Catchment	Description	Area (ha)	% Impervious	Flow Length (m)	Slope (%)
To Nichol Drain No. 1					
C1	Undevelopment/Woods	136.9	0	1826	0.3
C2	Based on Bonaire Model	13.2			
C3	Based on Bonaire Model	31.8			
C4	Low-density Residential	81.1	10	1437	0.7
C5a	Residential Undevelopment/Woods	77.3 102.7	40 0	2031	1.0
C5b	Residential Undevelopment/Woods	13.0 107.0	40 0	2031	1.0
C6a	Undevelopment/Woods	77.1	0	1013	1.5
C6b	Undevelopment/Woods	60.5	0	1229	1.2
C6c	Undevelopment/Woods	66.5	0	1959	1.5

Table A.6 – Existing and Current Conditions Catchment Parameters (MTE Updated)

Catchment	VO #	Description	Area (ha)	% Impervious	Flow Length (m)	Slope (%)
To Nichol Drain No. 1						
C1	100	Rural/Woods	136.98	0	1736	0.3
C2	200*	Based on Bonaire Hydrology Model				
C3	300*	Based on Bonaire Hydrology Model				
C4	400	Low-density Residential	82.86	10	1437	0.7
C5a	510*	Based on North-West Fergus Secondary Plan Model				
C5b	520	Rural/Woods	108.36	0	2649	0.8
C6a	610	Rural/Woods	78.05	0	1080	1.1
C6b	620*	Based on Ainley Farm Subdivision Model				
	621	Agricultural	6.56	0	400	4
	622	Agricultural	9.69	0	450	5
	623	Agricultural	19.37	0	520	3
	624	Agricultural	11.84	0	250	3
	625	Agricultural	6.72	0	200	2.5
	626	External Roadway	1.06	60	84.06	1
	627	Floodplain	9.39	0	50	3
C6c	630	Agricultural	33.04	0	410	3.5
	636	Agricultural	3.32	0	500	2.5
	637	Agricultural	8.36	0	550	3
	638	Agricultural	20.63	0	530	3
	639	Agricultural/ Woods	4.6	0	450	3

Table A.7 – Proposed Conditions Parameters (MTE Updated)

Catchment	VO #	Description	Area (ha)	% Impervious	Flow Length (m)	Slope (%)
To Nichol Drain No. 1						
C1	100	Rural/Woods	136.98	0	1736	0.3
C2	200*	Based on Bonaire Hydrology Model				
C3	300*	Based on Bonaire Hydrology Model				
C4	400	Low-density Residential	82.86	10	1437	0.7
C5a	510*	Based on North-West Fergus Secondary Plan Model				
C5b	520	Rural/Woods	108.36	0	2649	0.8
C6a	610	Rural/Woods	78.05	0	1080	1.1
C6b	620*	Based on Ainley Farm Subdivision Model				
	621	Residential	20.87	47	400	4
	622.1	Residential	0.61	58	75	4
	622	Residential	8.95	58	450	5
	623	Residential	6.47	64	520	3
	624	Residential	12.78	68	640	3
	625	Residential	12.18	70	330	2.5
	627	Floodplain	9.39	0	50	3
	628	SWMF	5.35	60	199	2
C6c	630	Agricultural	33.04	0	410	3.5
	636	Agricultural	3.60	0	500	2.5
	637	Agricultural	8.42	0	550	3
	638	Agricultural	20.63	0	530	3
	639	Agricultural/ Woods	4.47	0	450	3

Table A.8 – SWMF1 Design Details

General	Facility Characteristics
Stormwater Management Facility Type	Wet Pond
Required MECP Water Quality Protection	Enhanced (Level 1)
Total Contributing Area	57.65ha
Imperviousness	59%
Bottom Elevation (Wet Pond)	402.5m
Storage	
Unit Area Storage Volume Requirements as per SWMMP (MOE 2003)	213m^3/ha
Required Total Volume	12,400m^3
Permanent Pool	
Required Permanent Pool Volume	10,070m^3
Permanent Pool Elevation	404.0m
Extended Detention	
Minimum Required Volume (based on 40m^3/ha)	2,330m^3
Extended Detention Elevation	404.3m
Peak Release Rate for Extended Detention (Quality)	0.006m^3/s
Quantity and Erosion Control (25mm-4hr)	
Approximate Drawdown Time	48 hours

Refer to SWMF1 illustrated on **Figure 6.2**

Table A.9 – SWMF2 – Design Details

General	Facility Characteristics
Stormwater Management Facility Type	Wet Pond
Required MECP Water Quality Protection	Enhanced (Level 1)
Total Contributing Area	8.95ha
Imperviousness	58%
Bottom Elevation (Wet Pond)	403.5m
Storage	
Unit Area Storage Volume Requirements as per SWMMP (MOE 2003)	213m^3/ha
Required Total Volume	1.888m^3
Permanent Pool	
Required Permanent Pool Volume	1.533m^3
Permanent Pool Elevation	405.0m
Extended Detention	
Minimum Required Volume (based on 40m^3/ha)	355m^3
Extended Detention Elevation	405.3m
Peak Release Rate for Extended Detention (Quality)	0.003m^3/s
Quantity and Erosion Control (25mm-4hr)	
Approximate Drawdown Time	48 hours

Refer to SWMF2 illustrated on **Figure 6.3**

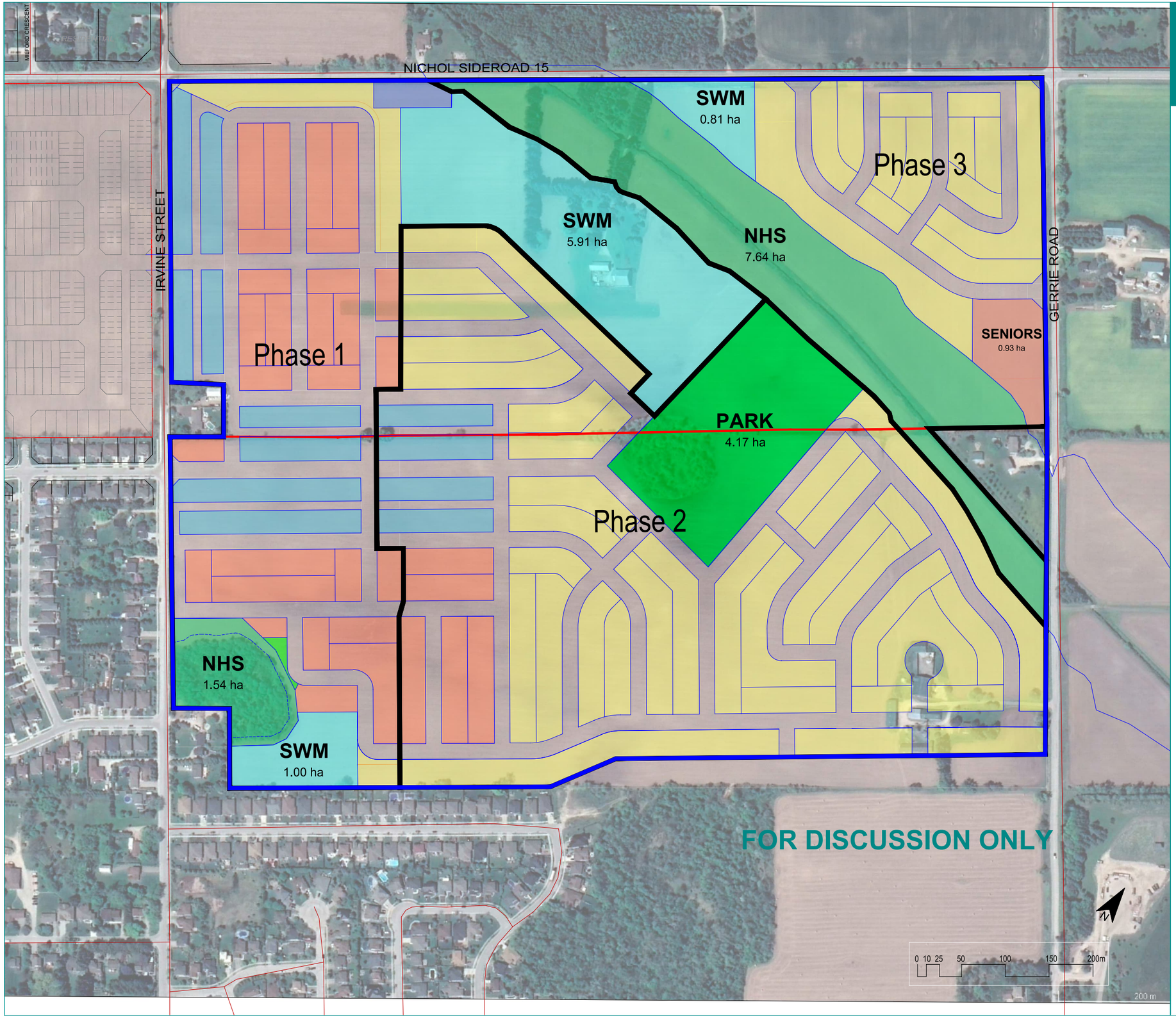
Table A.10 – SWMF3a/3b – Design Details

General	Facility Characteristics
Stormwater Management Facility Type	Wet Pond
Required MECP Water Quality Protection	Enhanced (Level 1)
Total Contributing Area	10.71ha
Imperviousness	70%
Bottom Elevation (Wet Pond)	409.0m
Storage	
Unit Area Storage Volume Requirements as per SWMMP (MOE 2003)	226m^3/ha
Required Total Volume	2,455m^3
Permanent Pool	
Required Permanent Pool Volume	2,020m^3
Permanent Pool Elevation	410.5m
Extended Detention	
Minimum Required Volume (based on 40m^3/ha)	435m^3
Extended Detention Elevation	409.3m
Peak Release Rate for Extended Detention (Quality)	0.003m^3/s
Quantity and Erosion Control (25mm-4hr)	
Approximate Drawdown Time	48 hours

Refer to SWMF3a illustrated on **Figure 6.4**
Refer to SWMF3b illustrated on **Figure 6.5**

Appendix B

Concept Plans (MGP)



PHASING PLAN

PHASE 1

LAND USE		AREA ha	AREA ac.	FRONTAGE m	FRONTAGE ft.	APPROX. UNITS
Developable Area						
Low Density Residential @	11 m	1.30	3.21	343	1,125	**31**
Low/Medium Density Residential @	6 m	6.56	16.21	1,864	6,115	**311**
Lane Access Residential @	6 m	3.31	8.18	1,105	3,626	**184**
Vista		0.05	0.12			
SWM		6.91	17.07			
Pumping Station		0.26	0.64			
Roads / Lanes		5.84	8.70			
SUBTOTAL		**24.23**	**59.87**	**3,312**	**10,866**	**526**
Non Developable Area						
NHS		1.54	3.81			
TOTAL		**25.77**	**63.68**	**3,312**	**10,866**	**526**

PHASE 2

LAND USE		AREA ha	AREA ac.	FRONTAGE m	FRONTAGE ft.	APPROX. UNITS
Low Density Residential @	11 m	17.61	43.51	4,735	15,534	**430**
Low/Medium Density Residential @	6 m	1.92	4.74	553	1,813	**92**
Lane Access Residential @	6 m	1.40	3.46	455	1,491	**76**
Park		4.17	10.30			
Vista		0.00	0.00			
SWM		0.00	0.00			
Roads / Lanes		9.09	22.46			
TOTAL		**34.19**	**84.48**	**5,742**	**18,838**	**598**

PHASE 3

LAND USE		AREA ha	AREA ac.	FRONTAGE m	FRONTAGE ft.	APPROX. UNITS
Developable Area						
Low Density Residential @	11 m	5.37	13.27	1,354	4,441	**123**
Seniors Residence		0.93	2.30			
Park		0.00	0.00			
SWM		0.81	2.00			
Roads / Lanes		2.07	5.11			
SUBTOTAL		**9.18**	**22.68**	**1,354**	**4,441**	**123**
Non Developable Area						
NHS		7.64	18.88			
TOTAL		**16.82**	**41.56**	**1,354**	**4,441**	**123**

TOTAL ALL PHASES

LAND USE		AREA ha	AREA ac.	FRONTAGE m	FRONTAGE ft.	APPROX. UNITS
Developable Area						
Low Density Residential @	11 m	24.28	60.00	6,431	21,100	**585**
Low/Medium Density Residential @	6 m	8.48	20.95	2,417	7,928	**403**
Lane Access Residential @	6 m	4.71	11.64	1,560	5,117	**260**
Seniors Residence		0.93	2.30			
Vista		0.05	0.12			
SWM		7.72	19.08			
Pumping Station		0.26	0.64			
Roads / Lanes		17.00	8.70			
TOTAL NET DEVELOPABLE AREA		**67.60**	**167.04**	**10,408**	**34,145**	**1,247**
Non Developable Area						
NHS		9.18	22.68			
TOTAL PROPERTY AREA		**76.78**	**189.72**	**10,408**	**34,145**	**1,247**

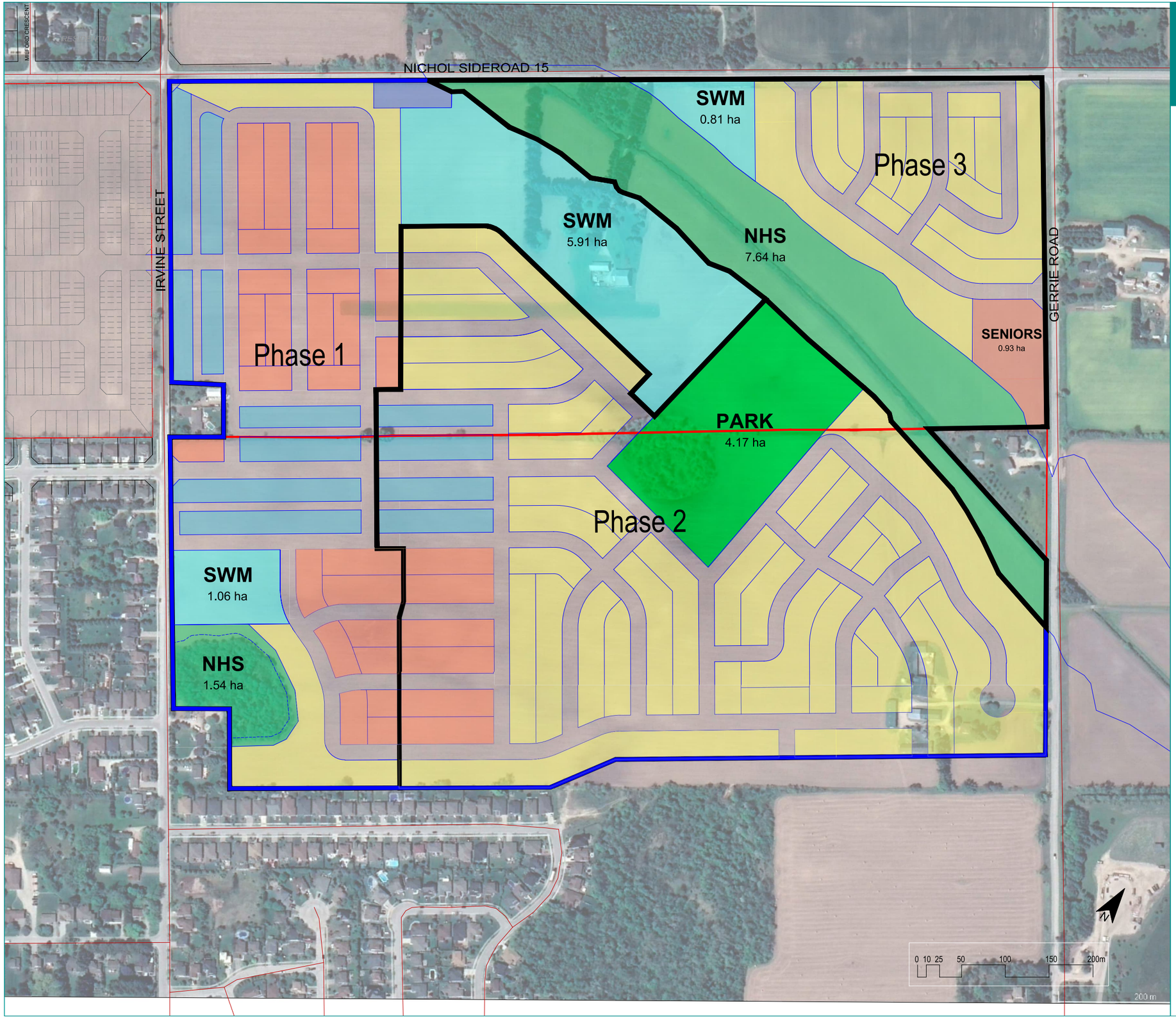
NOTE: Development limits are preliminary and subject to ruther technical study.

Frontage lengths have been discounted by 10% to compensate for inefficiencies in lotting.

Prepared For:
ELORA SANDS DEVELOPMENTS INC.

MGP File No.: 22-3192
Date:February 28, 2025

MGP Malone Given Parsons.
140 Renfrew Drive, Suite 201 | Markham, ON | L3R 6B3
905 513 0170 | mgp.ca



ALTERNATIVE CONCEPT PLAN

PHASE 1

LAND USE		AREA		FRONTAGE		APPROX. UNITS
Developable Area		ha	ac.	m	ft.	
Low Density Residential @	11 m	2.45	6.05	523	1,716	48
Low/Medium Density Residential @	6 m	5.68	14.04	1,638	5,374	273
Lane Access Residential @	6 m	3.31	8.18	1,105	3,626	184
SWM		6.98	17.25			
Pumping Station		0.26	0.64			
Roads / Lanes		5.55	8.70			
SUBTOTAL		**24.23**	**59.87**	**3,266**	**10,715**	**505**
Non Developable Area						
NHS		1.54	3.81			
TOTAL		**25.77**	**63.68**	**3,266**	**10,715**	**505**

PHASE 2

LAND USE		AREA		FRONTAGE		APPROX. UNITS
		ha	ac.	m	ft.	
Low Density Residential @	11 m	17.79	43.96	4,563	14,970	415
Low/Medium Density Residential @	6 m	1.99	4.92	569	1,866	95
Lane Access Residential @	6 m	1.40	3.46	455	1,491	76
Park		4.17	10.30			
SWM		0.00	0.00			
Roads / Lanes		8.84	21.84			
TOTAL		**34.19**	**84.48**	**5,586**	**18,328**	**585**

PHASE 3

LAND USE		AREA		FRONTAGE		APPROX. UNITS
Developable Area		ha	ac.	m	ft.	
Low Density Residential @	11 m	5.37	13.27	1,354	4,441	123
Seniors Residence		0.93	2.30			
Park		0.00	0.00			
SWM		0.81	2.00			
Roads / Lanes		2.07	5.11			
SUBTOTAL		**9.18**	**22.68**	**1,354**	**4,441**	**123**
Non Developable Area						
NHS		7.64	18.88			
TOTAL		**16.82**	**41.56**	**1,354**	**4,441**	**123**

TOTAL ALL PHASES

LAND USE		AREA		FRONTAGE		APPROX. UNITS
Developable Area		ha	ac.	m	ft.	
Low Density Residential @	11 m	25.61	63.28	6,440	21,127	585
Low/Medium Density Residential @	6 m	7.67	18.95	2,207	7,240	368
Lane Access Residential @	6 m	4.71	11.64	1,560	5,117	260
Seniors Residence		0.93	2.30			
SWM		7.79	19.25			
Pumping Station		0.26	0.64			
Roads / Lanes		16.46	8.70			
TOTAL NET DEVELOPABLE AREA		**67.60**	**167.04**	**10,206**	**33,484**	**1,213**
Non Developable Area						
NHS		9.18	22.68			
TOTAL PROPERTY AREA		**76.78**	**189.72**	**10,206**	**33,484**	**1,213**

FOR DISCUSSION ONLY

NOTE: Development limits are preliminary and subject to ruther technical study.

Prepared For:

ELORA SANDS DEVELOPMENTS INC.

MGP File No.: 22-3192
Date: February 28, 2025

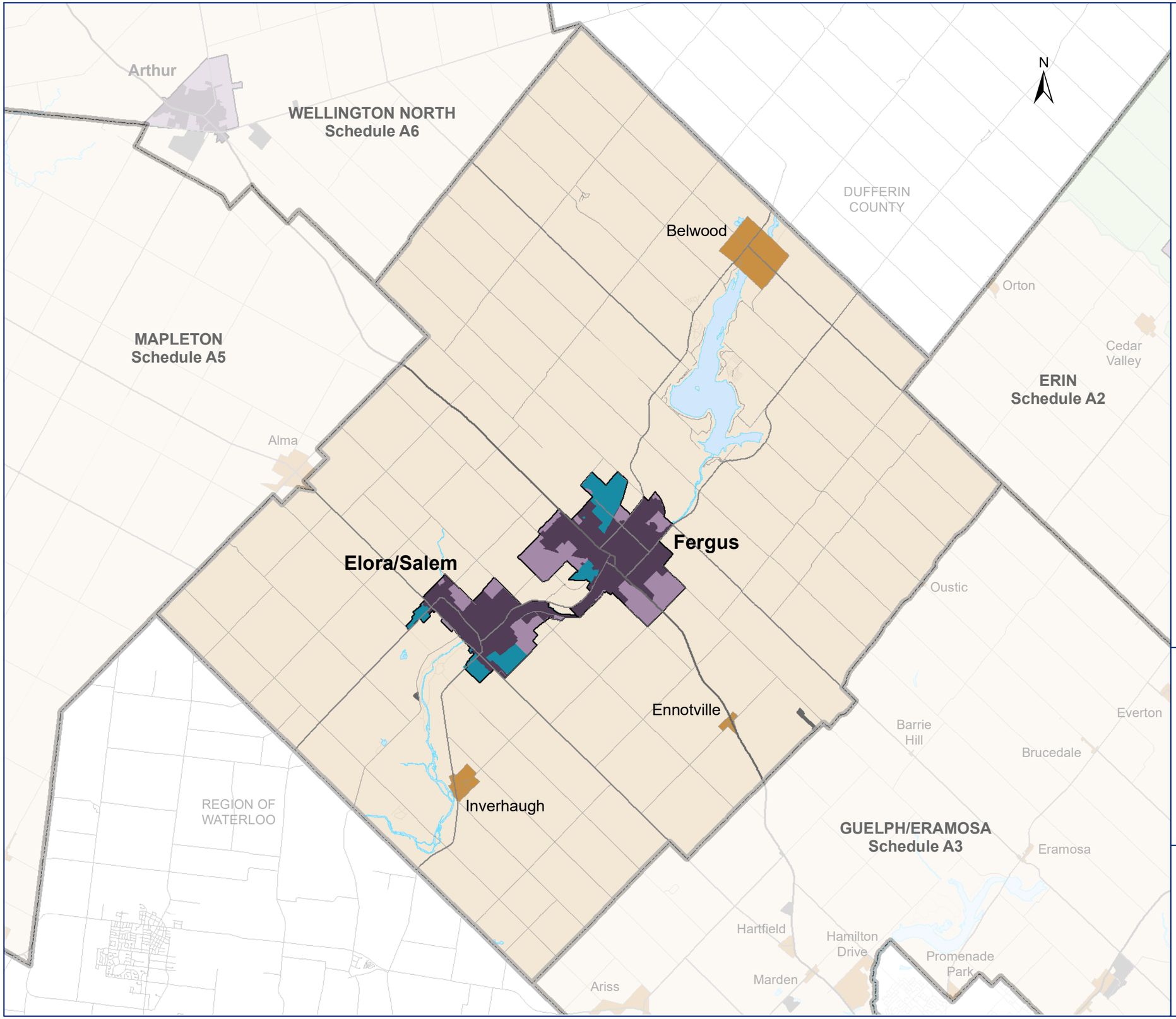
MGP Malone Given Parsons.
140 Renfrew Drive, Suite 201 | Markham, ON | L3R 6B3
905 513 0170 | mgp.ca

Appendix C

County of Wellington Official Plan Schedule A1

County Growth Structure

CENTRE WELLINGTON



Urban System

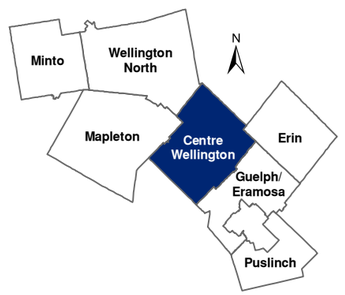
- Primary Urban Centre
- Delineated Built-up Area
- Designated Greenfield Area
- Employment Area

Rural System

- Hamlet
- Rural Employment Area

Other

- Waterbody/Watercourse



Produced by: County of Wellington Planning & Development Department

This is not survey data. All rights reserved.
May not be reproduced without permission.

Sources:
County of Wellington 2024
Ministry of Natural Resources and Forestry,
© King's Printer for Ontario, 2024.

Last Revised: July 2024

0 1.5 3 6 km

Schedule A1
County of Wellington Official Plan

Document Path: F:\LIS\Projects\Official Plan\Official Plan Schedules and Mapping\Schedule A1_Centre Wellington_Growth Structure.mxd

Appendix D

Geotechnical and Hydrogeological Investigations

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

401 Grays Road · Hamilton, ON · L8E 2Z3

www.soil-mat.ca info@soil-mat.ca 905.318.7440 / 800.243.1922 (*toll free*) 905.318.7455

PROJECT NO.: SM 241154-G February 28, 2025

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Brendan Walton, P.Eng.
Engineering Manager, Land Development

HYDROGEOLOGICAL CONSIDERATIONS
PROPOSED RESIDENTIAL DEVELOPMENT
ELORA SAND AND KEATING LANDS
ELORA, ONTARIO

Dear Mr. Walton,

Further to your recent information and request, and meetings with the project team, SOIL-MAT ENGINEERS & CONSULTANTS LTD. have prepared the following hydrogeological considerations report to address the existing subsurface soil and groundwater conditions over the Elora Sands and Keating Lands development area.

1. INTRODUCTION

SOIL-MAT ENGINEERS has conducted a Preliminary Hydrogeological Assessment [SM - 301951-G, dated July 20, 2022], Supplemental Groundwater Data [SM 301951-G, dated August 19, 2024] and Geotechnical Investigation [SM 301951-G, dated September 3, 2021] over the Elora Sands and Clayton Lands portion of the proposed development area. In addition to this information, we have been provided borehole and ground water information for the Ainley Farm Subdivision [Hydrogeological Study Ainley Farm Subdivision, GM BluePlan Engineering, April 12, 2023] to the south of the Keating Lands and the Elora Medows Residential Development [Hydrogeological Investigation Elora Medows Residential Development, Waterloo Geoscience Consultants Ltd., September 19, 2025] which has since been constructed. The purpose of this hydrogeological considerations report is to provide a high-level summary of the hydrogeological conditions of the subject site from geotechnical perspective, and comments with respect to the feasibility of proposed development of the subject lands.

2. SITE AND SUBSURFACE CONDITIONS

Drawing No. 1, Site Plan, illustrates the subject lands.

As noted above, prior investigations by our office have been conducted on the Elora Sands lands, as well as the Clayton lands to the northwest. In addition, investigations by others have been conducted on the Elora Meadows development to the west, and the Ainley Farm lands to the southeast. This information has been reviewed and summarised in the following discussion, however it is noted that our full reports for Elora Sands and Clayton lands should be referenced for the complete description and discussion of the site conditions.

GEOLOGIC SETTING

A review of publicly available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soil in the immediate area to consist of a mixture of stone poor silty sand to sandy silt till, ice-contact stratified deposits of sand and gravel with minor silt and clay, and glaciofluvial deposits of gravely and sandy material.

SUBSURFACE SOIL CONDITIONS

SOIL-MAT ENGINEERS has conducted detailed geotechnical investigation works over the subject site [SM 301915-G, dated October 14, 2021], as well as hydrogeological assessment [SM 301951-G, dated July 20, 2022]. These site investigations included the advancement of sampled boreholes across the site, multiple grain size analyses on recovered soil samples, and have thoroughly characterised the onsite subsurface conditions.

The subsurface soils were investigated to depths of up to approximately 8.2 metres below the existing grade, and found to consist of sandy silt to silty sand till deposits in the upper levels with some areas and variable layers of clayey sandy silt till with depth, with generally trace amounts of gravel. Occasional deposits of gravelly sand were encountered within some of the boreholes. As such, the presence of permeable granular deposits or ‘veins’ should be expected across the site.

Grain size analyses conducted on ten [10] recovered soil samples at varying depths demonstrated the following:

- Clay contents in the range of 2 to 22%, average of 10%
- Silt in the range of 4 to 51%, average of 26%
- Sand in the range of 26 to 94%, average of 53%
- Gravel in the range of 0 to 43%, average of 9%

These conditions are consistent with the referenced geology mapping information indicating stone poor silty sand to sandy silt till, to glaciofluvial deposits of gravely and sandy material. There is limited to negligible indication of ice-contact stratified deposits of sand and gravel with minor silt and clay.

It is noted that the conditions established in the boreholes advanced on the Elora Sands lands are consistent with those reported in referenced reports by others for the Elora Meadows and Ainley Farm lands. Predominantly sandy silt and silty sand till, with varying more clayey layers, and limited gravel content.

The areas indicated as having greater clay content should be further evaluated for potential use as low-permeable recompacted clay liner material for SWM ponds, in the event that lining of the ponds is determined to be required.

It is noted that a portion of the site has been designated as an area of sand and gravel resource of primary and secondary significance. However, given the limited gravel content established, these deposits would not be considered as significant sand and gravel resource in terms of aggregate production.

GROUNDWATER CONDITIONS

A total of seventeen [17] groundwater monitoring wells were installed within the Elora Sands and Clayton Lands development areas over the course of the geotechnical investigation and hydrogeological assessment works. Groundwater readings have been collected both manually and through installed data loggers from August of 2021 to May 2023, the results of which have been summarised as follows;

TABLE A
SUMMARY OF MANUAL GROUNDWATER READINGS (ELORA SANDS)

Borehole No. 004 (Ground Surface Elevation of 405.55 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	2.74	402.8
August 27, 2021	1.75	403.8
February 23, 2022	1.33	404.2
April 22, 2022	1.47	404.1
June 1, 2022	1.78	403.8
May 3, 2023	1.20	404.35

Borehole No. 201 (Ground Surface Elevation of 404.80 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.69	402.1
April 22, 2022	1.88	402.9
June 1, 2022	2.44	402.4
May 3, 2023	1.88	402.9

Borehole No. 201A (Ground Surface Elevation of 404.75 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.8
April 22, 2022	2.05	402.7
June 1, 2022	2.43	402.3
May 3, 2023	1.71	403.1

Borehole No. 202 (Ground Surface Elevation of 406.59 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	5.5	401.1
April 22, 2022	4.76	401.8
June 1, 2022	5.43	401.2
May 3, 2023	4.51	402.1

Borehole No. 203 (Ground Surface Elevation of 407.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.0
April 22, 2022	5.90	401.2
June 1, 2022	5.91	401.2
May 3, 2023	Dry	<401.0

Borehole No. 204 (Ground Surface Elevation of 409.56 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.81	406.7
April 22, 2022	1.16	408.4
June 1, 2022	1.53	408.0
May 3, 2023	1.20	408.4

Borehole No. 205 (Ground Surface Elevation of 412.99 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.56	410.4
April 22, 2022	2.25	410.7

June 1, 2022	2.39	410.6
May 3, 2023	2.34	410.6

Borehole No. 206 (Ground Surface Elevation of 412.88 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	6.83	406.1
April 22, 2022	4.60	408.3
June 1, 2022	4.66	408.2
May 3, 2023	4.76	408.1

Borehole No. 401 (Ground Surface Elevation of 420.91 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
April 22, 2022	2.29	418.6
June 1, 2022	2.39	418.5
May 3, 2023	2.31	418.6

TABLE B
SUMMARY OF MANUAL GROUNDWATER READINGS (CLAYTON LANDS)

Borehole No. 101 (Ground Surface Elevation of 408.60 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	4.78	403.8
August 27, 2021	4.71	403.9
October 14, 2021	4.33	404.3
February 23, 2022	4.31	404.3
April 22, 2022	4.07	404.5
June 1, 2022	4.15	404.5
May 3, 2023	4.06	404.5

Borehole No. 102 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	3.58	410.6
August 27, 2021	3.61	410.5
October 14, 2021	3.62	410.5
February 23, 2022	3.50	410.6
April 22, 2022	2.89	411.2
June 1, 2022	3.05	411.1
May 3, 2023	3.00	411.0

Borehole No. 103 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	6.78	407.3
August 27, 2021	6.96	407.2
October 14, 2021	7.09	407.0
February 23, 2022	6.83	407.3
April 22, 2022	6.13	408.0
June 1, 2022	6.28	407.8
May 3, 2023	6.56	407.6

Borehole No. 301 (Ground Surface Elevation of 412.75 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.29	406.5
April 22, 2022	5.65	407.1
June 1, 2022	5.71	407.0
May 3, 2023	5.85	406.9

Borehole No. 302 (Ground Surface Elevation of 413.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.62	406.4
April 22, 2022	6.06	406.9
June 1, 2022	6.12	406.9
May 3, 2023	6.35	406.7

Borehole No. 303 (Ground Surface Elevation of 414.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	5.40	408.6
April 22, 2022	6.04	407.9
June 1, 2022	6.11	407.9
May 3, 2023	6.41	407.6

Borehole No. 304 (Ground Surface Elevation of 407.90 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	2.87	405.0
April 22, 2022	2.60	405.3
June 1, 2022	2.96	404.9
May 3, 2023	2.42	4055

Borehole No. 305 (Ground Surface Elevation of 408.60 metres)*

	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	Dry	<405.6
April 22, 2022	Dry	<405.6
June 1, 2022	Dry	<405.6
May 3, 2023	Dry	<405.6

*Ground surface elevations have been interpolated based on contours from current topographic survey

As noted above, additional groundwater information was provided for the Ainley Farm subdivision as well as the Elora Medows development. The spring high values were utilised in conjunction with the above recorded measurements to evaluate the groundwater conditions across the proposed development lands. The readings used have been summarised as follows;

TABLE C
SUMMARY OF MANUAL GROUNDWATER READINGS (AINLEY FARM)

Borehole No.	Date	Elevation
101	April 8, 2014	413.60
102	April 8, 2014	412.51
103	April 8, 2014	413.77
104	April 8, 2014	410.71
105	April 8, 2014	414.02
106	April 8, 2014	411.02
107	April 8, 2014	409.61
108	April 8, 2014	409.33

TABLE D
SUMMARY OF MANUAL GROUNDWATER READINGS (ELORA MEADOWS)

Borehole No.	Date	Elevation
12	April 14, 2005	395.17
13	April 14, 2005	406.68
14	April 14, 2005	405.29
15	April 14, 2005	405.97
16	April 14, 2005	410.71
17	April 14, 2005	410.09
18	April 14, 2005	410.00
19	April 14, 2005	407.98
20	April 14, 2005	405.48

The combined groundwater data from similar time of year has been utilised to compile the groundwater contour plan for the area, illustrated in Drawing No. 2. It is noted that the current data provides for a good resolution and confidence in the groundwater contours over the Elora Sand and Clayton lands, Elora Meadows and Ainley Farm lands.

Within the Keating lands the groundwater contours have been extrapolated based on the available data, and considering the existing topography. These are considered to be reasonable and appropriate at this stage of assessment, however it would be necessary to undertake specific detailed study to support detailed design of future proposed development on the Keating lands.

The groundwater flow, as illustrated in Drawing No. 2, generally follows the site topography. Overall, the groundwater flow is from southeast to northwest across the subject sites, and then splitting to the north towards the Nichol Drain and Irvine Creek, and to the southwest and west to Irvine Creek. The majority of the site drains toward the Nichol Drain to the north which ultimately outlets to the Irvine Creek and the Grand River. The southwest portion of the sites drain towards a noted wetland at the southwest corner of the Keating lands, and ultimately west to Irvine Creek and the Grand River.

WETLAND AREA

It is noted a designated wetland area [Queen Street Wetland] is located in the southwest corner of the Keating lands. The available topography indicates the average ground surface elevation at this location is approximately 410 to 411 metres, with a preliminary measurement of water level within the wetland on the order of 410.5 metres. This is roughly coincident with the groundwater elevation at that location indicated on the Groundwater Contour Plan. The wetland does not have any apparent connection to a watercourse, and it is anticipated that the wetland is fed through shallow groundwater due to localised low topography versus the groundwater level, and surface runoff. There does not appear to be any indication of an upward gradient, or upwelling, in the groundwater conditions that would be supply the wetland. Rather, there may be a slight downward vertical gradient. This would suggest the wetland is primarily supplied by precipitation and surface runoff, however this should be confirmed through more detailed hydrogeological assessment.

SOURCE WATER PROTECTION CONSIDERATIONS

Terra-Dynamics Inc. has conducted a Source Water Protection Due Diligence Review of the subject site, and is appended for reference. This review provides detailed information and discussion with respect to surface and groundwater, including Well Head Protection Areas and Significant Groundwater Recharge Areas. This report is appended for reference, and key items noted as follows.

Nichol Drain is identified as a groundwater discharge area, with the regional groundwater levels above the elevation of the drain. This is consistent with monitoring well observations on the Elora Sands lands. The Drain is noted as having coldwater fishery potential, and should be considered as a coldwater stream with respect to stormwater management design and construction. Further assessment of the Nichol Drain is warranted to support and inform detailed design of site development.

Groundwater recharge of the site has likely been over-estimated in regional studies, as site specific investigations have demonstrated predominantly silty sand/sandy silt till deposit, less permeable than the sand and gravel indicated on regional mapping.

The bedrock aquifer beneath the site has a primarily low vulnerability [vulnerability scores of 2, 4 and 6], with a small portion of the southern area [Keating Lands] mapped as medium vulnerability [score of 8], and a very small portion at the southwest of the site mapped and high vulnerability [score of 10]. Considering the conditions and relevant policies significant water quality threats are not expected as part of residential development, it is not expected that there will be constraints on the residential development of the site.

DISCUSSION AND RECOMMENDATIONS

The subsurface soil and groundwater conditions, as outlined above, are discussed in detail in our Hydrogeological Investigation for the Clayton and Elora Sands lands. This report should be referred to as the commentary and discussion remains valid and applicable to assessing the feasibility of development for both the Elora Sands and Keating lands. The overburden soils are predominantly silty sand and sandy silt till, with occasional more clayey zones and limited sand and gravel.

Groundwater is present at depths ranging between approximately 2 to 7 metres below the existing grade, generally being shallower in topographically low areas, including near the Nichol Drain and adjacent to the Queen Street Wetland at the southwest of the Keating lands.

Site grading should consider the existing topography, raising the grade in low areas and cutting in higher areas, in order to minimise potential interaction with groundwater. With appropriate grading preventing interaction between groundwater and foundations, and largely limiting interaction during construction of site servicing. As such, conflict or impact to groundwater conditions are not expected to be a significant concern. The exception may be deeper services [trunk sewers], which may require some level of temporary construction dewatering. On a preliminary basis, this would be anticipated to be below 50,000 L/day in most cases, with potential for deeper excavations to exceed 400,000 L/day. This would warrant further assessment as part of detailed design.

The on-site soils, while generally less permeable than the sand and gravel indicated on regional mapping, present a moderately permeable condition that would be supportive of LID systems. This would include lot level infiltration, infiltration galleries, etc., as part of the overall stormwater management and water balance for the site development. This would warrant further assessment as part of detailed design.

Stormwater management ponds located at topographic low locations on the site would be appropriate. Portions of the site presents as potentially sufficiently clayey to be suitable for use as recompacted clay liner, in the event that it is determined that lining of the SWM ponds is required. Alternatively, the use of available geosynthetic clay liner systems may be considered.

It is noted that the subject lands are within a Wellhead Protection Area (WHPA). Water wells in the area are drawing from a much deeper confined aquifer, and would be unaffected by proposed development of the subject lands. Based on the available information, there will be no anticipated negative impact with respect to the deep bedrock aquifer serving as the potable supply source for private and municipal potable wells within the area.

Based on the currently available information, including detailed hydrogeological assessments of the Elora Sands lands, and the Elora Meadows and Ainley Farm lands, the subject lands are considered to be feasible for residential development. Appropriate design considerations and strategies will be able to readily and adequately account for and mitigate potential concerns. Further detailed assessment will be warranted, as noted, to support detailed design of future development.

GENERAL COMMENTS

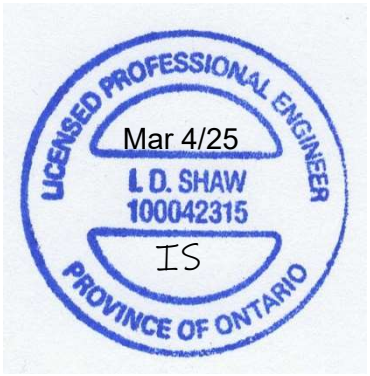
The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this Hydrogeological Report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Kevin Reid, B.Eng., EIT.
Engineer in Training

Ian Shaw, P. Eng., QP_{ESA}
Senior Engineer

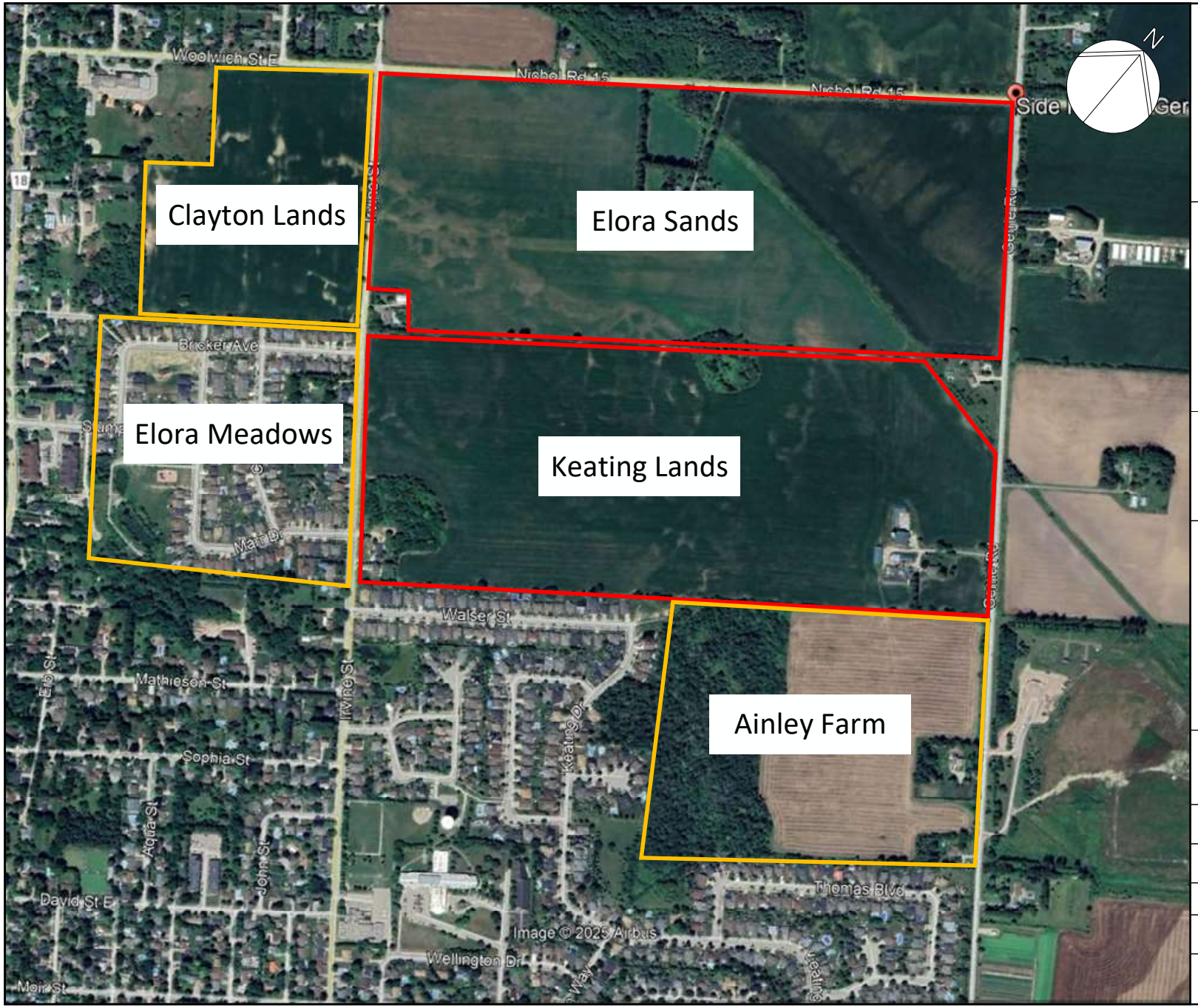


Enclosures: Drawing No. 1, Site Plan
Drawing No. 2, Groundwater Contour Plan

References:

Source Water Protection Due Diligence Review [Terra-Dynamics, dated February 27, 2025]
Preliminary Geotechnical and Hydrogeological Investigation [SM 301951A-G, dated October 12, 2021]
Preliminary Hydrogeological Assessment [SM 301951-G, dated November 4, 2022]
Supplemental Groundwater Data [SM 301951-G, dated August 19, 2024]

Distribution: Cachet Developments [pdf]



LEGEND

Subject Lands

Adjacent Sites

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 241154-G.

.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Hydrogeological Considerations
Elora Sands and Keating Lands
Elora, Ontario

Site Plan

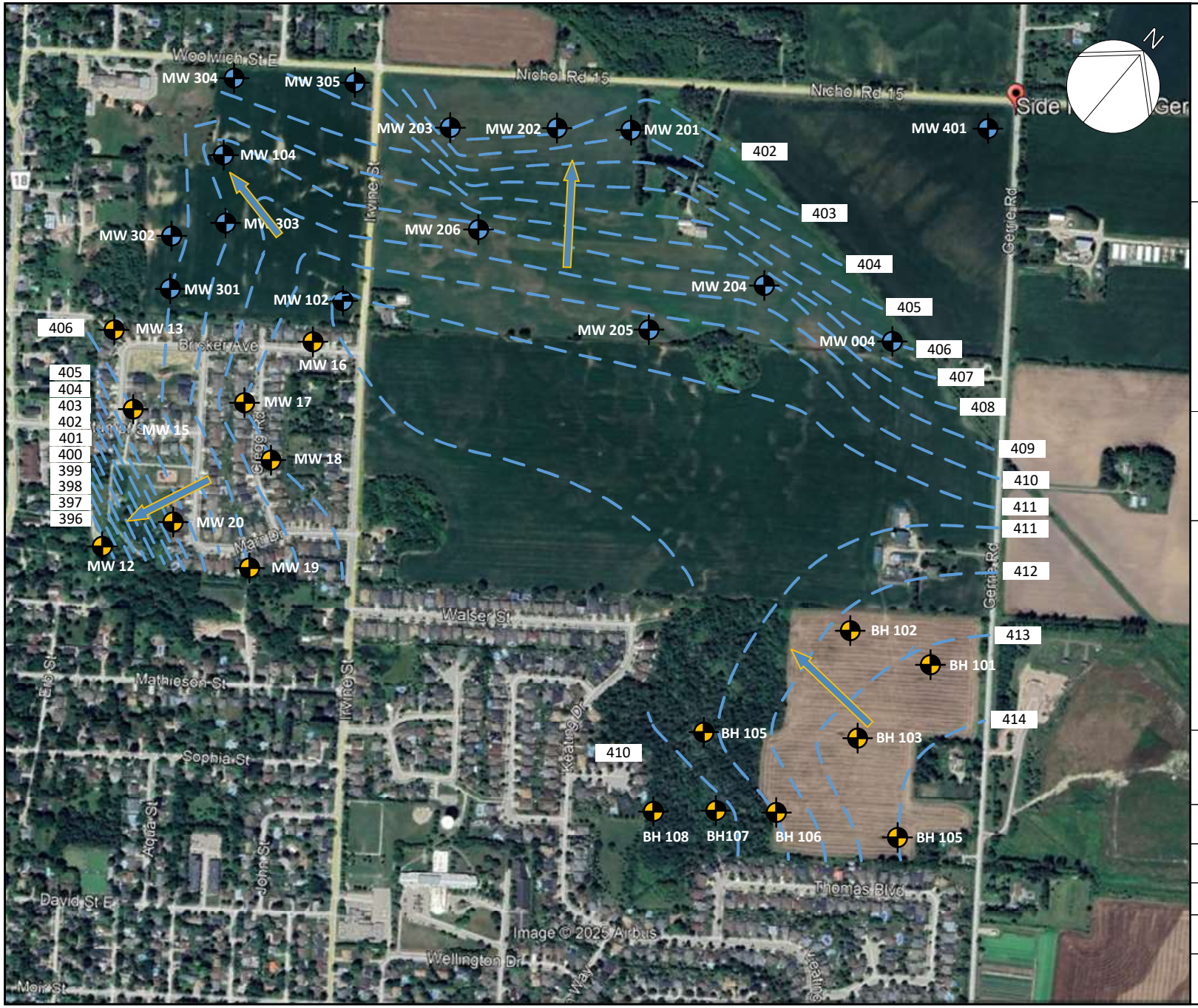
Project No. SM 241154-G

Date: February 2025

Drawn: KJR	Checked: IS

SM 241154-G Site Plan

Drawing No. 1



LEGEND

Soil-Mat Monitoring Well Location (MW#)

Monitoring Well Location By Others

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 241154-G.

2. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Hydrogeological Considerations
Elora Sands and Keating Lands
Elora, Ontario

Groundwater Contour Map

Project No. SM 241154-G

Date: February 2025

Drawn: KJR | Checked: IS

SM 241154-G Groundwater Contour Map

Drawing No. 2

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

Hamilton: 130 Lancing Drive L8W 3A1 T: 905.318.7440 F: 905.318.7455
Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 800.243.1922

PROJECT NO.: SM 301951B-G October 14, 2021

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Marcus Gagliardi
Development Planner

PRELIMINARY GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
75 WOOLWICH STREET EAST
ELORA, ONTARIO

Dear Mr. Gagliardi,

Further to your authorisation and subsequent discussions with Mr. Michael DeBiasio, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has completed the fieldwork, laboratory testing, and report preparation in connection with the above noted project. The scope of work was completed in general accordance with our proposal P301951, dated July 1, 2021, later revised and confirmed through email communication on August 3, 2021. This report should be read in conjunction with the formal report for the Gibson Farms to the east SM 301951A-G, dated October 5, 2021. Our comments and recommendations based on our findings at the four [4] borehole locations are presented in the following paragraphs.

1. INTRODUCTION

We understand that the project will involve the construction of a residential development consisting of single-family dwellings and townhouses along asphalt paved roadways, including the installation of associated underground municipal services, located at 75 Woolwich Street East [Clayton Lands] in Elora, Ontario. The purpose of this preliminary geotechnical investigation work was to assess the subsurface soil and groundwater conditions, and to provide our comments and recommendations with respect to the design and construction of the proposed development, from a geotechnical point of view.

SOIL-MAT ENGINEERS was provided with a sub-watershed study that encompasses the surrounding area – including the subject site – prepared by Aquafor Beech Limited, dated February 2008. The results of this investigation have been considered in preparation of this geotechnical report.

This report is based on the above summarised project description, and on the assumption that the design and construction will be performed in accordance with applicable codes and standards. Any significant deviations from the proposed project design may void the recommendations given in this report. If significant changes are made to the proposed design, this office must be consulted to review the new design with respect to the results of this investigation. It is noted that SOIL-MAT ENGINEERS has also conducted Phase One and Two Environmental Site Assessments (ESAs) for the subject site, which have been reported under a separate cover.

2. PROCEDURE

A total of four [4] sampled boreholes were advanced at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan. The boreholes were advanced using continuous flight power auger equipment on August 6, 2021 under the direction and supervision of a staff member of SOIL-MAT ENGINEERS & CONSULTANTS LTD., to termination at depths of between approximately 3.6 and 7.6 metres below the existing ground surface.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on all soil samples recovered from the borings. Selected samples were also subjected to laboratory grain size analyses.

Upon completion of drilling, groundwater monitoring wells were installed at Borehole Nos. 1, 2, and 4 to allow for the future monitoring of the groundwater level. The monitoring well consisted of 50-millimetre PVC pipe screened in the lower 1.5 to 3.0 metres. The monitoring well was encased in well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite ‘hole plug’ to the surface and fitted with a protective steel ‘stick up’ casing. The remaining boreholes were backfilled in

general accordance with Ontario Regulation 903, and the ground surface was reinstated even with the surrounding grade.

The boreholes were located in the field by representatives of SOIL-MAT ENGINEERS, based on accessibility over the site, clearance of underground utilities, and the drawing that was forwarded to our office. Best efforts were made to minimize crop damage by locating the majority of the boreholes to the perimeter of the fields. The ground surface elevation at the borehole locations has been referenced to a geodetic benchmark, described as North American 1983 CSRS, as per the survey plan completed by POI Aerial, dated August 10, 2021, which was provided to our office.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 1 to 4, inclusive, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed at the exact depths of geological change.

3. SITE DESCRIPTION AND SUBSURFACE CONDITIONS

The subject site is currently an undeveloped agricultural property located at Woolwich Street East in Elora, Ontario. The parcel is bordered to the east by Irvine Street, to the south by Bricker Avenue, to the west by residential dwellings and a public school, and to the north by Woolwich Street East. The grade is relatively flat and even at the south portion of the site, sloping gently up towards the north, before quickly descending to the north towards Woolwich Street East with an approximate relief of 6 metres measured across the boreholes.

The subsurface conditions encountered at the borehole locations are summarised as follows:

Topsoil

A surficial veneer of topsoil approximately 100 to 250 millimetres in thickness was encountered at all borehole locations. It is noted that the depth of topsoil may vary across the site and from the depths encountered at the borehole locations. It is also noted that the term ‘topsoil’ has been used from a geotechnical point of view, and does

not necessarily reflect its nutrient content or ability to support plant life. Given the property has been historically used for agricultural purposes the upper levels of the soils would be expected to have a reworked nature resulting in more variable depths of topsoil over the site. As such, it is recommended that a conservative approach be taken when estimating topsoil quantities across the site for stripping, i.e. account for slightly greater stripping depth than those specifically noted at the borehole locations.

Sandy Silt/Clayey Silt

Native sandy silt/clayey silt was encountered beneath the topsoil in Borehole Nos. 1, 2, and 3. The fine-grained granular to slightly cohesive soils were brown in colour, with trace to some clay and gravel, with a notable increasing clay content with depth in some of the boreholes. The native sandy silt/clayey silt soils were generally noted to have a reworked or weathered appearance in the upper levels, and were generally noted to have a compact state. The sandy silt/clayey silt deposit was present to depths of approximately 0.9 to 2.2 metres in Borehole Nos. 2 and 3, and proven to termination within Borehole No. 1 at a depth of approximately 6.1 metres below the existing ground surface.

Sand

A native sand deposit was encountered beneath the topsoil in Borehole No. 4, and beneath the sandy silt/clayey silt layer in Borehole Nos. 2 and 3. The fine to medium grained soils were brown in colour, contained trace amounts of clay, silt, and gravel, and was generally in a loose to compact state. The native sand soils were proven to termination at depths of approximately 3.6 and 7.6 metres below the existing ground surface.

Grain Size Analyses

Grain size analyses were conducted on three [3] selected samples of the native soils recovered from the boreholes. The results of this grain size testing can be found appended to the end of this report, and are summarized as follows:

TABLE A
GRAIN SIZE ANALYSES

Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH2 SS6	4.6 m	2	6	91	1	10^{-2}	150 to 300
BH3 SS3	1.5 m	14	45	34	7	10^{-6}	<10
BH4 SS4	2.3 m	2	9	89	0	10^{-3} to 10^{-2}	100 to 150

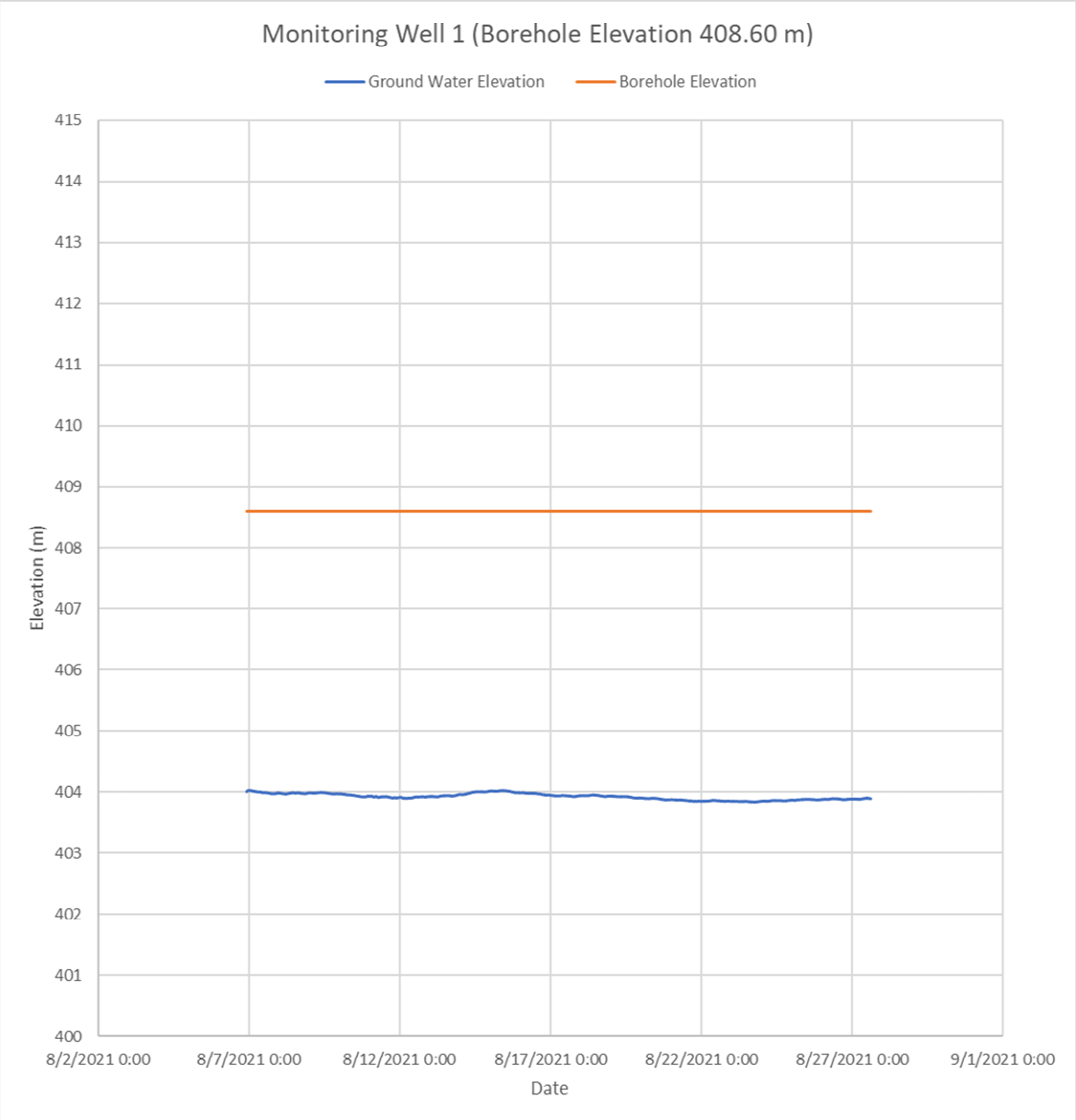
The field and laboratory testing demonstrate the native soils to generally consist of a sandy silt/clayey silt with some clay and traces of gravel in the upper levels, transitioning to a highly permeable sand with traces of clay, silt, and gravel at depth. According to the Unified Soil Classification System (USCS), the soils are classified as M.L. – inorganic silts and very fine sands, clayey silts with slight plasticity in the upper levels overlying S.P. – poorly graded sands, with little to no fines at depth. The sandy silt/clayey silt in the upper levels would generally behave as a low permeable material, but would not be considered as an impermeable material, and would be highly frost susceptible. The underlying sand deposit is highly permeable, relatively free draining.

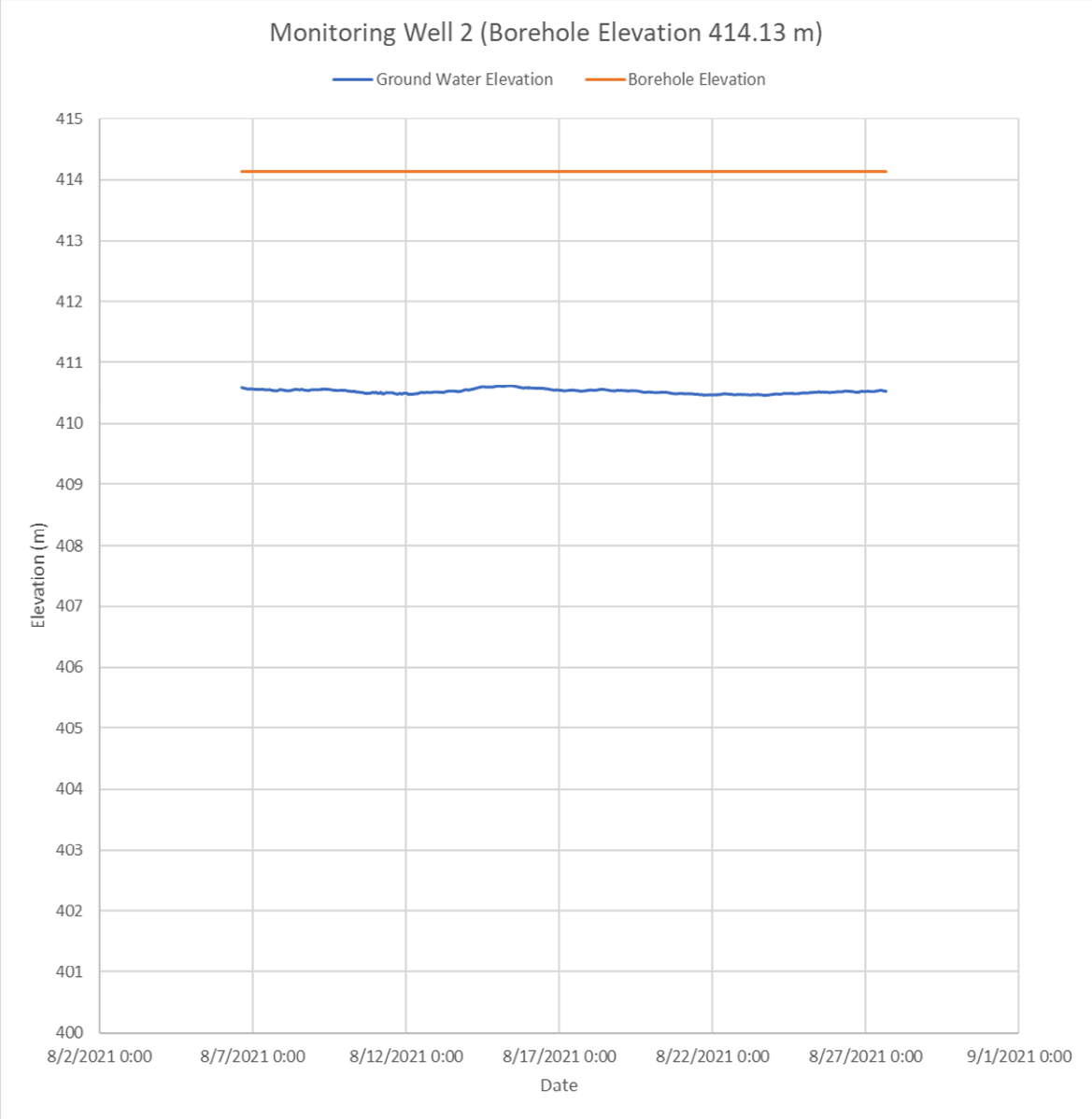
A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soils to be in areas noting to consist of stone-poor sandy silt to silty sand-textured till, ice-contact stratified deposits of sand and gravel, with minor silt and clay, as well as river deposits of coarse gravel. These conditions are consistent with the observations during drilling.

Groundwater Observations

Borehole No. 2 was noted to have ‘caved’ to a depth of approximately 3.8 metres and ‘wet’ at a depth of approximately 3.6 metres, while Borehole No. 4 was noted to be open and ‘wet’ at a depth of 7.0 metres upon completion. Borehole Nos. 3 was noted to have cave to a depth of 2.7 metres, and dry upon completion. Borehole No. 1 was noted as being open and ‘dry’ [i.e. no free groundwater present] upon completion of drilling. It is noted that insufficient time would have passed for the static groundwater level to stabilise in the open boreholes.

As noted above, a monitoring well was installed at Borehole Nos. 1, 2, and 4, to allow for future measurements of the static groundwater level. Furthermore, it is noted that an additional monitoring well was installed on the abutting parcel of land to the east, the work of which was completed in concert with the fieldwork on the Clayton Lands. A data logger was installed in Borehole Nos. 1 and 2 to allow for continuous monitoring of the groundwater level between August 6 and August 27, 2021, the readings of which have been illustrated in the following graphs:




Monitoring Well 2 (Borehole Elevation 414.13 m)
Ground Water Elevation
Borehole Elevation
Elevation (m)
415
414
413
412
411
410
409
408
407
406
405
404
403
402
401
400
8/2/2021 0:00
8/7/2021 0:00
8/12/2021 0:00
8/17/2021 0:00
8/22/2021 0:00
8/27/2021 0:00
9/1/2021 0:00
Date

In addition to this, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on August 6 and August 27, 2021 and have been summarized in the following chart:

TABLE B
SUMMARY OF GROUNDWATER LEVELS

Monitoring Well	Ground Surface Elevation [m]	August 6, 2021		August 27, 2021	
		Groundwater Depth [m]	Groundwater Elevation [m]	Groundwater Depth [m]	Groundwater Elevation [m]
MW1	408.60	4.78	403.82	4.71	403.89
MW2	414.13	3.58	410.55	3.61	410.52
MW4	414.87	6.78	408.09	6.96	407.91

The groundwater levels observed at these monitoring well locations, as well as the monitoring well installed at the adjacent property [summarised in our geotechnical report SM 301951A-G under a separate cover] indicate a stabilized groundwater level on the order of approximately 2 to 7 metres below the existing grade, at an elevation of roughly 403.8 to 410.5 metres, varying with the physical topography. This data is based on the groundwater data collected from Borehole Nos. 1, 2, and 4, as well as the monitoring well installed on the Gibson Farm land to the east. It is noted that the groundwater level would be expected to fluctuate seasonally. It is also noted that the observed groundwater levels may be influenced by more localised shallower 'perched' deposits in more permeable seams within the sandy silt/clayey silt. Further long-term monitoring may allow for a more accurate estimate of the static groundwater level, including more data during the 'wet' and 'dry' seasons.

As noted above, SOIL-MAT ENGINEERS was also provided a sub-watershed study by Aquafor Beech, which included a number of monitoring wells to the east to monitor the groundwater elevations. The conditions and groundwater levels described in this geotechnical report are consistent with those encountered during our fieldwork as described above.

General Soil Conditions

As noted above the subsurface conditions are generally characterized as sandy silt/clayey silt deposit in the upper levels, underlain by a permeably cohesionless sand deposit. The grain size analyses indicate the sandy silt/clayey silt soils to have 10 to 20 percent clay content, lending a slightly cohesive characteristic. The sandy silt/clayey silt soils are relatively consistent in terms of its constituents but are noted to contain an increasing clay content with depth in some of the boreholes, as noted above. Where the material transitions into a sand the native soils are generally fine in gradation in the upper levels, becoming medium to coarse with depth. As demonstrated above the subsurface conditions exhibit a relatively inconsistent layered structure across the large area, but can be generally distinguished by a layer of slightly cohesive sandy silt overlying a cohesionless sand. The conditions will be best assessed during excavations on an area-by-area basis. As such it may also be prudent to advance a series of test excavations in the area of proposed deeper excavations and/or stormwater management ponds to confirm soil composition and groundwater conditions in the area of deep excavations.

4. EXCAVATIONS

Excavations for the installation of foundations and underground services are anticipated to extend to depths of up to approximately 2 to 5 metres below the existing grade. Excavations through the native sandy silt/clayey silt and sand soils, as well as any engineered fill placed as part of site grading works, should be relatively straightforward, with the sides remaining stable for short construction periods at inclinations of up to 45 degrees to the horizontal, and possibly steeper depending on moisture condition and clay content. Where wet or more permeable seams are encountered, during periods of extended precipitation, or where excavations extend below the static groundwater level, the sides of excavations should be expected to ‘slough in’ to as flat as 3 horizontal to 1 vertical, or flatter.

Nevertheless, all excavations must comply with the current Occupational Health and Safety Act and Regulations for Construction Projects. The native sandy silt/clayey silt and sand soils would generally be considered a Type 2 or 3 soil, depending on the moisture content and relative compact to dense condition, as outlined in the Ontario Health and Safety Act III – Excavations. Excavation slopes steeper than those required in the Safety Act must be supported and a senior geotechnical engineer from this office should monitor the work.

As noted above, the groundwater level varies between depths of approximately 2 to 7 metres below the existing grade, roughly elevation 403.8 to 410.5 metres. The majority of excavations are anticipated to be above the groundwater level. Nevertheless, some infiltration of water from more permeable seams and surface runoff into the open excavations should be anticipated. Such infiltration should be readily controlled using typical construction dewatering methods. 'Perched' deposits of water may be encountered within more permeable pockets, which may require greater initial dewatering efforts and instability in the excavations, especially during the 'wet' times of the year. Where excavations extend to greater depths, to and below the groundwater level, especially within the sand deposit, the rate of infiltration will be much greater and additional pumping or more sophisticated dewatering methods should be anticipated. In this regard, ongoing monitoring of the groundwater levels, and careful review of the design servicing elevations, is recommended. As noted above, the advancement of test excavations in the area of proposed deep services and stormwater management ponds would allow for a first hand look at how groundwater levels may affect such excavations. More water should be expected when connections are made to existing services. Surface water should be directed away from the excavations.

The base of the excavations in the native soils, above the groundwater level, encountered in the boreholes should generally remain firm and stable. Where excavations extend to greater depths, to or below the groundwater level, or where 'perched' water is encountered, some base instability should be expected, especially during 'wet' times of the year. This will be especially likely in the high silt content sandy silt/clayey silt soils. Areas of base instability may be stabilised with the placement of additional bedding or ballast stone, the use of coarser stone material, etc. The appropriate measures are best assessed based on the actual conditions at the time of construction. With a firm and stable base condition, stabilised where warranted, standard pipe bedding material as specified by the Ontario Provincial Standard Specification [OPSS] or County of Wellington should be satisfactory. The bedding should be well compacted to provide sufficient support to the pipes and components (i.e. valve chambers, manholes etc.), and to minimize settlements of the roadway above the service trenches. Special attention should be paid to compaction under the pipe haunches.

We recommend that the invert elevations of any storm sewer pipes for rear yard catch basins be located above the proposed underside of footing elevations of adjacent residential structures, or that the trench excavations should be filled with 5 MPa 'lean mix' concrete product to the proposed underside of footing level where the excavations

extend below an imaginary 10 horizontal to 7 vertical line extending outwards and down from a point 0.3 metres beyond the proposed townhouse foundations.

Any utility poles, light poles, etc. located within 3 metres of the top of an excavation slope should be braced to ensure their stability. Likewise, temporary support might be required for other existing above and below ground structures, including existing underground services, roadways, etc. depending on their proximity to the trench excavations.

5. BACKFILL CONSIDERATIONS

The excavated material will consist primarily of the sandy silt/clayey silt and sand soils encountered in the boreholes as described above. These soils are generally considered suitable for use as engineered fill, trench backfill, etc., provided that they are free of organics, construction debris, or other deleterious material, and that its moisture content can be controlled to within 3 per cent of its standard Proctor optimum moisture content.

It is noted that the sandy silt/clayey silt soils encountered are not considered to be free draining and should not be used where this characteristic is necessary. It is also noted that these fine grained granular soils will present difficulties in achieving effective compaction when they become 'wet' of optimum, and where access with compaction equipment is restricted. The sandy silt/clayey silt soils encountered are generally considered to be near to slightly 'dry' of their standard Proctor optimum moisture content, with some noted 'wet' seams. Some moisture conditioning will be required depending upon the weather conditions at the time of construction. It is noted that these silty soils will become nearly impossible to compact when wet of its optimum moisture content. Any material that becomes wet to saturated should be spread out to allow to dry, or removed and discarded, or utilised in non-settlement sensitive areas. The sand soils are generally well draining, and tend to be near optimum moisture content. At depth, approaching or below the water level, the sand soils will be expected to be saturated, requiring time to drain excess moisture or other drying efforts in order to achieve effective compaction.

We note that where backfill material is placed near or slightly above its optimum moisture content, the potential for long term settlements due to the ingress of groundwater and collapse of the fill structure is reduced. Correspondingly, the shear strength of the 'wet' backfill material is also lowered, thereby reducing its ability to support construction traffic and therefore impacting roadway construction. If the soil is

well dry of its optimum value, it will appear to be very strong when compacted, but will tend to settle with time as the moisture content in the fill increases to equilibrium condition. The fine grained to cohesive soils encountered may require high compaction energy to achieve acceptable densities if the moisture content is not close to its standard Proctor optimum value. It is therefore very important that the moisture content of the backfill soils be within 3 per cent of its standard Proctor optimum moisture content during placement and compaction to minimise long term subsidence [settlement] of the fill mass. Any imported fill required in service trenches or to raise the subgrade elevation should have its moisture content within 3 per cent of its optimum moisture content and meet the necessary environmental guidelines.

A representative of SOIL-MAT should be present on-site during the backfilling and compaction operations to confirm the uniform compaction of the backfill material to project specification requirements. Close supervision is prudent in areas that are not readily accessible to compaction equipment, for instance near the end of compaction 'runs'. Backfill within service trenches, areas to be paved, etc., should be placed in loose lifts not exceeding 300 millimetres in thickness and compacted to a minimum of 95 per cent of its standard Proctor maximum dry density [SPMDD], and to 100 per cent of its SPMDD in the upper 1 metre below the design subgrade level. All structural fill should be compacted to 100 per cent of its SPMDD. The appropriate compaction equipment should be employed based on soil type, i.e. pad-toe for cohesive soils and smooth drum/vibratory plate for granular soils. A method should be developed to assess compaction efficiency employing the on-site compaction equipment and backfill materials during construction.

6. MANHOLES, CATCH BASINS AND THRUST BLOCKS

Properly prepared bearing surfaces for manholes, valve chambers, etc. in the native competent soils, stabilised where required, will be practically non-yielding under the anticipated loads. Proper preparation of the founding soils will tend to accentuate the protrusion of these structures above the pavement surface if compaction of the fill around these structures is not adequate, causing settlement of the surrounding paved surfaces. Conversely, the pavement surfaces may rise above the valve chambers and around manholes under frost action. To alleviate the potential for these types of differential movements, free-draining, non-frost susceptible material should be employed as backfill around the structures located within the paved roadway limits, and compacted to 100 per cent of its standard Proctor maximum dry density. A geofabric separator

should be provided between the free draining material and the on-site silt soils to prevent the intrusion of fines.

The thrust blocks in the native soils or engineered fill may be conservatively sized as recommended by the applicable Ontario Provincial Standard Specification conservatively using a horizontal allowable bearing pressure of up to 150 kPa [~2,000 psf]. Any backfill required behind the blocks should be a well-graded granular product and should be compacted to 100 per cent of its standard Proctor maximum dry density.

7. PAVEMENT STRUCTURE DESIGN CONSIDERATIONS

All areas to be paved must be cleared of all organic and otherwise unsuitable materials, and the exposed subgrade proof rolled with 3 to 4 passes of a loaded tandem-axle truck in the presence of a representative of SOIL-MAT ENGINEERS & CONSULTANTS LTD., immediately prior to the placement of the sub-base material. Any areas of distress revealed by this or other means should be subexcavated and replaced with suitable backfill material. Where the subgrade condition is poorer it may be necessary to implement more aggressive stabilisation methods, such as the use of coarse aggregate [50-millimetre clear stone, 'rip rap', etc.] 'punched' into the soft areas.

Good drainage provisions will optimise the long-term performance of the pavement structure. The subgrade must be properly crowned and shaped to promote drainage to the subdrain system. Subdrains should be installed to intercept excess subsurface water and to prevent softening of the subgrade material. Surface water should not be allowed to pond adjacent to the outer limits of the paved areas.

The most severe loading conditions on the subgrade typically occur during the course of construction, therefore precautionary measures may have to be taken to ensure that the subgrade is not unduly disturbed by construction traffic. SOIL-MAT should be given the opportunity to review the final pavement structure design and subdrain scheme prior to construction to ensure that they are consistent with the recommendations of this report.

If construction is conducted under adverse weather conditions, additional subgrade preparation may be required. During wet weather conditions, such as during the fall and spring months, it should be anticipated that additional subgrade preparation will be required, such as additional depth of Ontario Provincial Standard Specification [OPSS] Granular 'B', Type II (crushed limestone bedrock) sub-base material. It is also important

that the sub-base and base granular layers of the pavement structure be placed as soon as possible after exposure, preparation and approval of the subgrade level.

The roadways through the residential subdivision would be required to adequately support cars, trucks and intermittent delivery and garbage trucks. A typical generic pavement structure would consist of 350 millimetres of OPSS Granular 'B', Type II (crushed bedrock) sub-base course, 150 millimetres of OPSS Granular 'A' base course, 60 millimetres of HL8 or HL4 binder course asphaltic concrete, and 40 millimetres of HL3 surface course asphaltic concrete. Where a pit run, Granular B Type I, aggregate is utilised in the granular base, it should be increased to a minimum thickness of 450 millimetres. It is our opinion that this design is suitable for use on a residential roadway section, provided that the subgrade has been prepared as specified and is good and firm before the sub-base course material is placed. Notwithstanding, the pavement structure should conform to the relevant County of Wellington requirements where they are to be assumed by the County. If the subgrade is soft, remedial measures as discussed above may have to be implemented and/or the sub-base thickness may have to be increased. The granular sub-base and base courses and asphaltic concrete layers should be compacted to OPSS or County of Wellington requirements. A program of in-place density testing must be carried out to monitor that compaction requirements are being met. We note that this pavement structure is not to be considered as a construction roadway design.

To minimise segregation of the finished asphalt mat, the asphalt temperature must be maintained uniform throughout the mat during placement and compaction. All too often, significant temperature gradients exist in the delivered and placed asphalt with the cooler portions of the mat resisting compaction and presenting a honeycomb surface. As the spreader moves forward, a responsible member of the paving crew should monitor the pavement surface, to ensure a smooth uniform surface. The contractor can mitigate the surface segregation by 'back-casting' or scattering shovels of the full mix material over the segregated areas and raking out the coarse particles during compaction operations. Of course, the above assumes that the asphalt mix is sufficiently hot to allow the 'back-casting' to be performed.

Asphalt paving of driveways should be consistent with the general recommendations provided above. Proper preparation of the subgrade soils is essential to good long-term performance of the pavement. Likewise, sufficient depth and compaction of granular base materials and adequate drainage will be important in achieving good long-term performance, i.e. preventing/limiting premature cracking, subgrade failure, rutting, etc. A typical recommended light duty pavement structure for residential driveways would

consist of a minimum of 200 millimetres of OPSS Granular 'A' base course, compacted to 100 percent standard Proctor maximum dry density, followed by a minimum of 50 millimetres of HL3 or HL3F asphaltic concrete, compacted to a minimum of 92 per cent of their Marshall maximum relative density [MRD].

8. HOUSE AND TOWNHOUSE CONSTRUCTION

The native soils encountered at the borehole locations are considered capable of supporting the loads associated with typical residential dwelling and townhouse structures on conventional spread footings, below any fill, organic, or otherwise unsuitable materials. Bearing pressures of up to 150 kPa [~3,000 psf] SLS and 225 kPa [~4,500 psf] ULS may be considered in the competent native soils. In areas where 'wet' seams are present, or the native soils present in less compact condition, reduced bearing values of 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] are recommended. The founding surfaces must be hand cleaned of any loose or disturbed material, along with any ponded water, immediately prior to placement of foundation concrete.

In the event that site grading works result in engineered fill below founding elevations, the general recommendations presented in the Backfill Considerations above should be strictly adhered to, with compaction to 100 percent standard Proctor maximum dry density, verified by monitoring and testing by a representative of SOIL-MAT ENGINEERS present on a full time basis. If there is a short fall in the volume of fill required, then the source of imported fill should be reviewed for gradation, Proctor value, compatibility with existing fill, environmental characteristics and be approved by this office prior to use. The design bearing capacity for footings within the engineered fill should be limited to 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] ULS.

The support conditions afforded by the native soils and/or engineered fill are generally not uniform across the building footprint, nor are the loads on the various foundation elements. As such it is recommended that consideration be given to the provision of nominal reinforcement in the footings and foundation walls to account for variable support and loading conditions. The use of nominal reinforcement is considered good construction practice as it will act to reduce the potential for cracking in the foundation walls due to minor settlements, heaving, shrinkage, etc. and will assist in resisting the pressures generated against the foundation walls by the backfill. Such nominal reinforcement is an economical approach to the reduction and prevention of costly foundation repairs after completion and later in the life of the buildings. This

reinforcement would typically consist of two continuous 15M steel bars placed in the footings [directly below the foundation wall], and similarly two steel bars placed approximately 300 millimeters from the top of the foundation walls at a minimum, depending on ground conditions exposed during construction. These reinforcement bars would be bent to reinforce all corners and under basement windows, and be provided with sufficient overlap at staggered splice locations. At 'steps' in the foundations and at window locations, the reinforcing steel should transition diagonally, rather than at 90 degrees, to maintain the continuous tensile capacity of the reinforcement. Where footings are founded on, or partially on, engineered fill the above provision for nominal reinforcement would be required.

All basement foundation walls should be suitably damp proofed, including the provision of a 'dimple board' type drainage product, and provided with a perimeter drainage tile system outlet to a gravity sewer connection or positive sump pit a minimum of 150 millimetres below the basement floor slab. The clear stone material surrounding the weeping tile should be encased with a geotextile material to prevent the migration of fines from the foundation wall backfill into the clear stone product. In the event that sump pit systems are required we would recommend that the sump pump system should be constructed with an 'oversized' reservoir and a 'back-flow' prevention valve so that the sump pump will not cycle repeatedly within short time periods.

All footings exposed to the environment must be provided with a minimum of 1.2 meters of earth or equivalent insulation to protect against frost penetration. This frost protection would also be required if construction were undertaken during the winter months. All footings must be proportioned to satisfy the requirements of the Ontario Provincial Building Code.

It is imperative that a soils engineer be retained from this office to provide geotechnical engineering services during the excavation and foundation construction phases of the project. This is to observe compliance with the design concepts and recommendations outlined in this report, and to allow changes to be made in the event that subsurface conditions differ from the conditions identified at the borehole locations.

9. PRELIMINARY HYDROGEOLOGICAL CONSIDERATIONS

As noted above, it is understood that the development will consist of single family dwellings and townhouse blocks, including the installation of associated underground municipal services along asphalt paved roadways. Excavations for the proposed development services are expected to extend to depths of up to approximately to 2 to 5 metres below the existing ground surface, while excavations for foundations would be expected to extend up to approximately 2 metres. Measurements of the groundwater level at the monitoring well locations indicate a groundwater level on the order of approximately 2 to 7 metres below the existing ground surface, however further groundwater monitoring may be conducted to more accurately assess the static groundwater level.

The short term excavations for the proposed servicing are generally anticipated to extend into the sandy silt/clayey silt and sand soils to depths above the static groundwater level. Depths of excavations should be confirmed via a preliminary site servicing and grading plan, which should be forwarded onto our office for further review and comments. Such excavations would be expected to be subject to relatively minor groundwater infiltration, such that it should be possibly to adequately control such infiltration using conventional construction dewatering techniques such as pumping from sumps in the base of the excavation. During wet times of year, some instability of the excavations may be experienced. The rate of dewatering would be expected to be below 50,000 L/day, and certainly below 400,000 L/day, such that an EASR or PTTW should not be required. Where deeper excavations are identified to be required, extending below the static groundwater level, the need for temporary dewatering controls during construction should be more closely evaluated. Depending on the proposed depths of excavations for the proposed footings and site services, the rate of dewatering could approach or be greater than 50,000 L/day, potentially requiring an EASR. As such, once available, the site servicing and grading plans detailing depths of construction should be forwarded onto our office for further review and comments.

The generally permeable condition of the native sand deposit present over the site will generally allow for natural drainage and movement of groundwater. As such, it is not considered likely that service trenches would present any conflict or impact to the natural groundwater conditions. As such, the provision of clay ‘cut-offs’ within trench backfill is not expected to be required.

Excavations for the proposed basement levels should be well above the groundwater level, and so would not be expected to require significant ongoing groundwater control,

other than typical perimeter weeping tile and sump pump as noted above. This should be confirmed once our office has had a chance to review the site servicing and grading plans.

The final grading of the site should appropriately consider the groundwater levels in order to minimise or avoid conflict or impact to the groundwater during and post construction. In this regard the grading and storm water management plan should accommodate surface runoff that follows the existing overall drainage patterns as much as possible.

It is also noted that the use of Low Impact Design [LID] methods as part of the stormwater management for the proposed development would be viable for much of the site and should be considered. The permeable sand deposit, above the groundwater level, would afford an opportunity for natural infiltration of surface runoff, such is in 'dry' ponds, infiltration galleries, etc.

Based on our observations and details of the proposed development, it is not anticipated that the proposed construction will have an adverse impact on the groundwater condition in the area, and further detailed hydrogeological assessment is not considered warranted at this time. As the detailed design of the proposed development proceeds, this office should be consulted to review the hydrogeological conditions and assess the potential for concern, or need for additional study.

10. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Scott Wylie, B.Eng., EIT.

Ian Shaw, P. Eng.
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Log of Borehole Nos. 1 to 4, inclusive
Grain Size Analyses
Drawing No. 2, Recommended Design Requirements for Basement Construction

Distribution: Cachet Developments [pdf]

LEGEND

Borehole Location
BH#

Monitoring Well Location
MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301951B-G.

2. Borehole locations are approximate.

SOIL-MAT
ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
75 Woolwich Street East
Elora, Ontario

Borehole Location Plan

Project No. SM 301591B-G

Date: October 2021

Drawn: SW | Checked: KR

SM 301591B-G Borehole Location Plan

Drawing No. 1

Log of Borehole No. 1

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838437
E: 545149

Depth (ft)	Depth (m)	Elevation (m)	Description	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	SAMPLE PP (kgf/cm2)	SAMPLE U.Wt.(kN/m3)
0	0	408.60	Ground Surface							
		402.50	End of Borehole							

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 6.10 metres.
2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. No soil samples were retrieved. The following free groundwater level readings have been measured:

August 6, 2021 - 4.78 metres below ground surface.

August 27, 2021 - 4.71 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 2

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838180
E: 545422

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		414.13	Ground Surface							
0	0	413.90	**Topsoil** Approximately 250 millimetres of topsoil.							
3	1	413.20	**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, loose to compact.	SS	1	4 5 7 8	12			
				SS	2	2 3 6 5	9			
			Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, loose to compact.	SS	3	3 9 12 14	21			
				SS	4	7 8 11 10	19			
				SS	5	6 9 11 17	20			
16	5	408.90	End of Borehole	SS	6	7 5 4 9	9			

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as caved to a depth of 3.8 metres and 'wet' at a depth of 3.6 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 3.58 metres below ground surface.

August 27, 2021 - 3.61 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 3

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4837942
E: 545194

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	412.55	Ground Surface								
0 / 0		**Topsoil** Approximately 100 millimetres of topsoil.		SS	1	5 5 7 8	12			
1		**Sandy Silt** Brown, trace to some gravel and clay, reworked in upper levels, compact.								
2				AS	2	6 5 3 3	8			
3 / 1										
4										
5				SS	3	5 6 6 6	12			
6										
7 / 2	410.30									
8		**Sand** Brown, trace clay, silt, and gravel, medium gradation, loose.		SS	4	2 3 3 2	6			
9										
10 / 3										
11				SS	5	2 1 1 2	2			
12	408.90									
13 / 4		End of Borehole								
14										
15										
16 / 5										
17										
18										
19 / 6										
20										
21										
22 / 7										
23										
24										
25 / 8										
26										
27										
28 / 9										
29										

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded dry and caved to a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 4

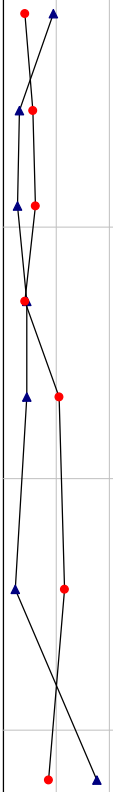
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838174
E: 545084

Depth (ft)	Depth (m)	Elevation (m)	Description	Sample Type	Sample Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		414.87	Ground Surface							
0	0	414.60	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, fine to medium gradation, compact.	SS	1	5 5 6 7	11			
2										
3	1			SS	2	8 9 9 7	18			
4										
5				SS	3	2 5 8 7	13			
6	2									
7				SS	4	6 11 16 13	27			
8										
9				SS	5	10 12 11 13	23			
10	3									
11										
12										
13	4									
14										
15				SS	6	5 10 13 15	23			
16										
17	5									
18										
19										
20	6	408.80	Wet spoon							
21				SS	7	9 9 8 6	17			
22										
23	7									
24		407.30								
25			End of Borehole							
26	8									
27										
28										
29										
30	9									
31										

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 7.6 metres.
2. Borehole was recorded as open and 'wet' at depth of 7.0 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

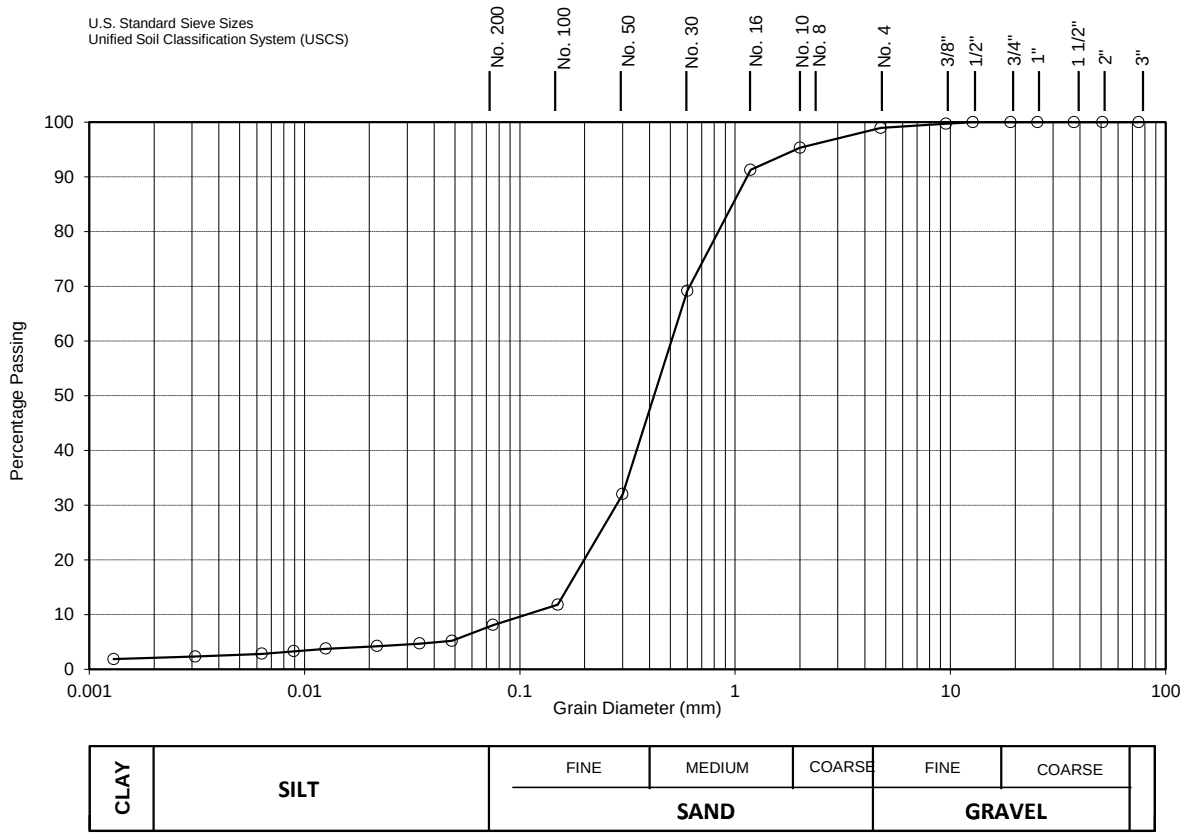
August 6, 2021 - 6.78 metres below ground surface.
August 27, 2021 - 6.96 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Mechanical & Hydrometer Analyses



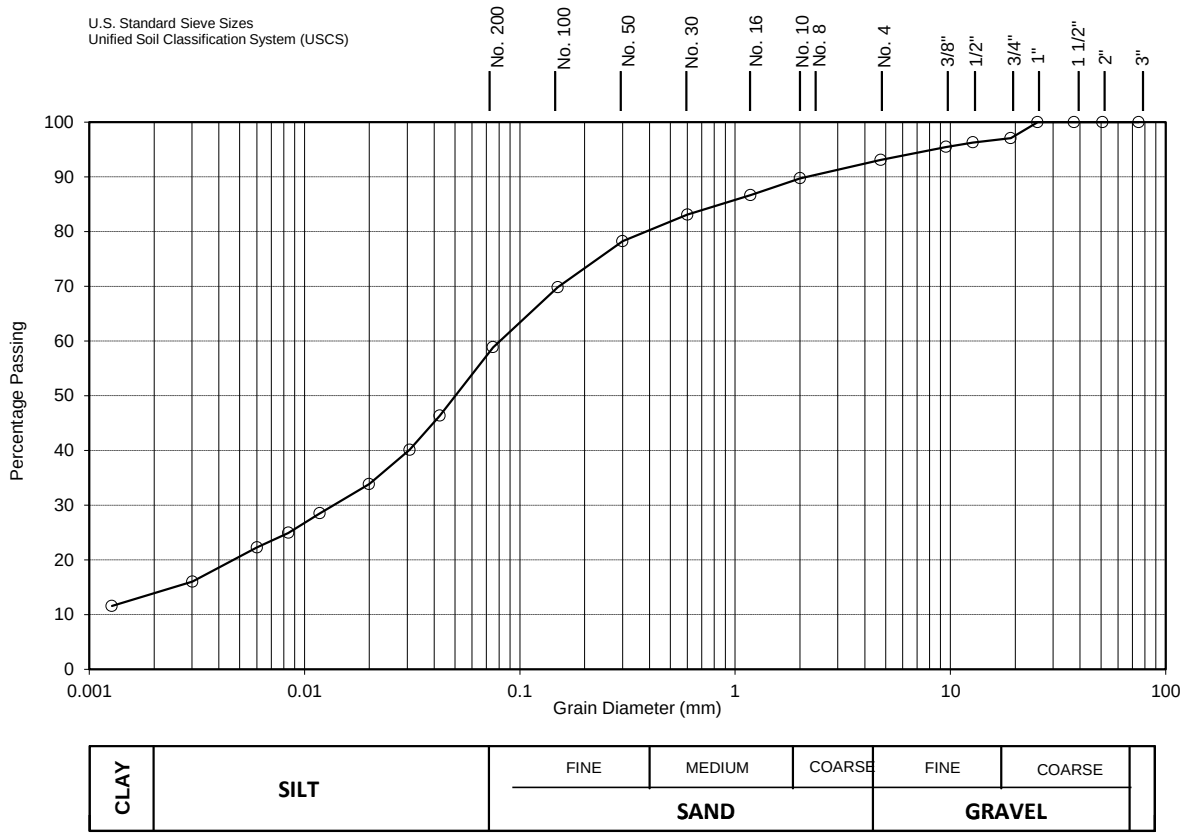
Lab No.:	**21-339**	Notes: Depth: 15'	
Sample No.:	**6**		
Borehole No.:	**2**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ traces of Silt, Clay and Gravel**	
SILT [%]:	**6**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**91**		
GRAVEL [%]:	**1**	Estimated Infiltration Rate [mm/hr] : **150 to 300**	Estimated Permeability, k [cm/s] **10^{-2}**
D_{10} (Effective Diam. in mm):	**0.10**	Coefficient of Uniformity C_U: **5.1**	Coefficient of Curvature C_C: **1.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 1**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



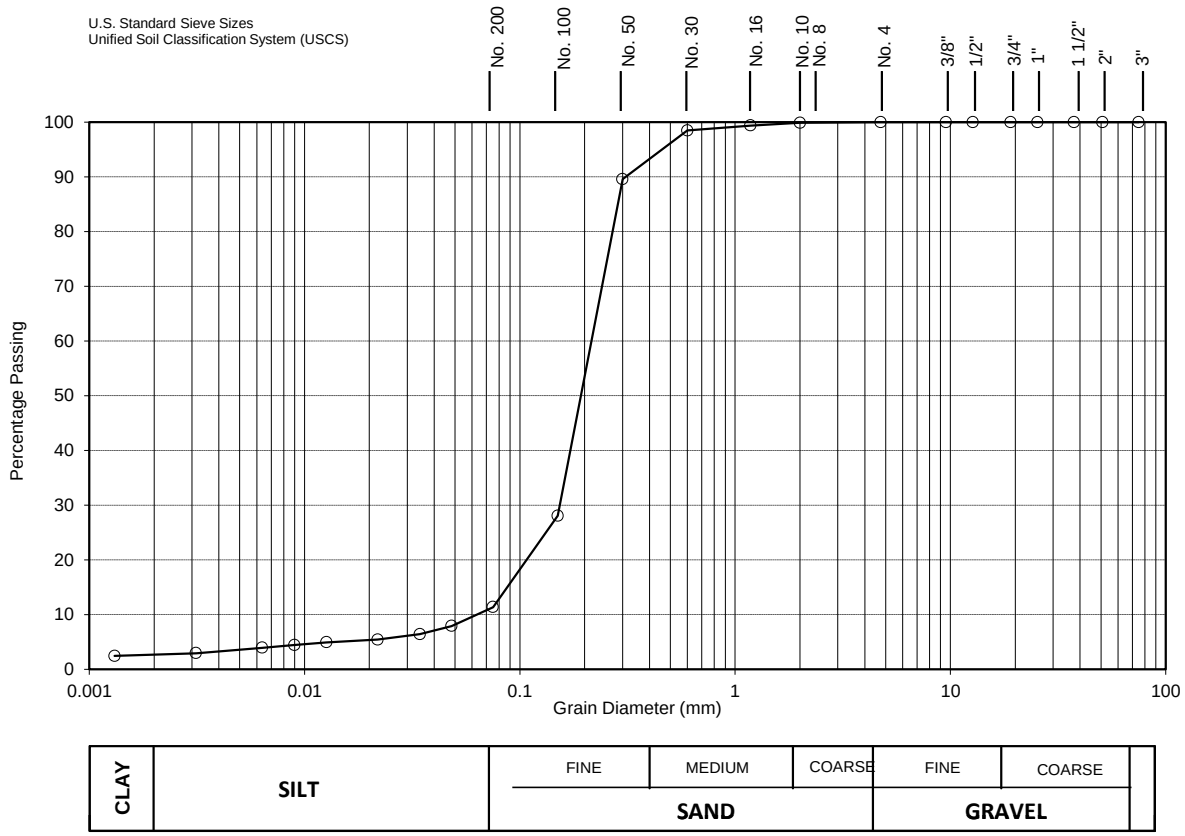
Lab No.:	**21-338**	Notes: Depth: 5'	
Sample No.:	**3**		
Borehole No.:	**3**		
CLAY [%]:	**14**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**45**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**34**		
GRAVEL [%]:	**7**	Estimated Infiltration Rate [mm/hr] : **< 10**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.00100**	Coefficient of Uniformity C_U: **80.0**	Coefficient of Curvature C_C: **2.1**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 2**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses

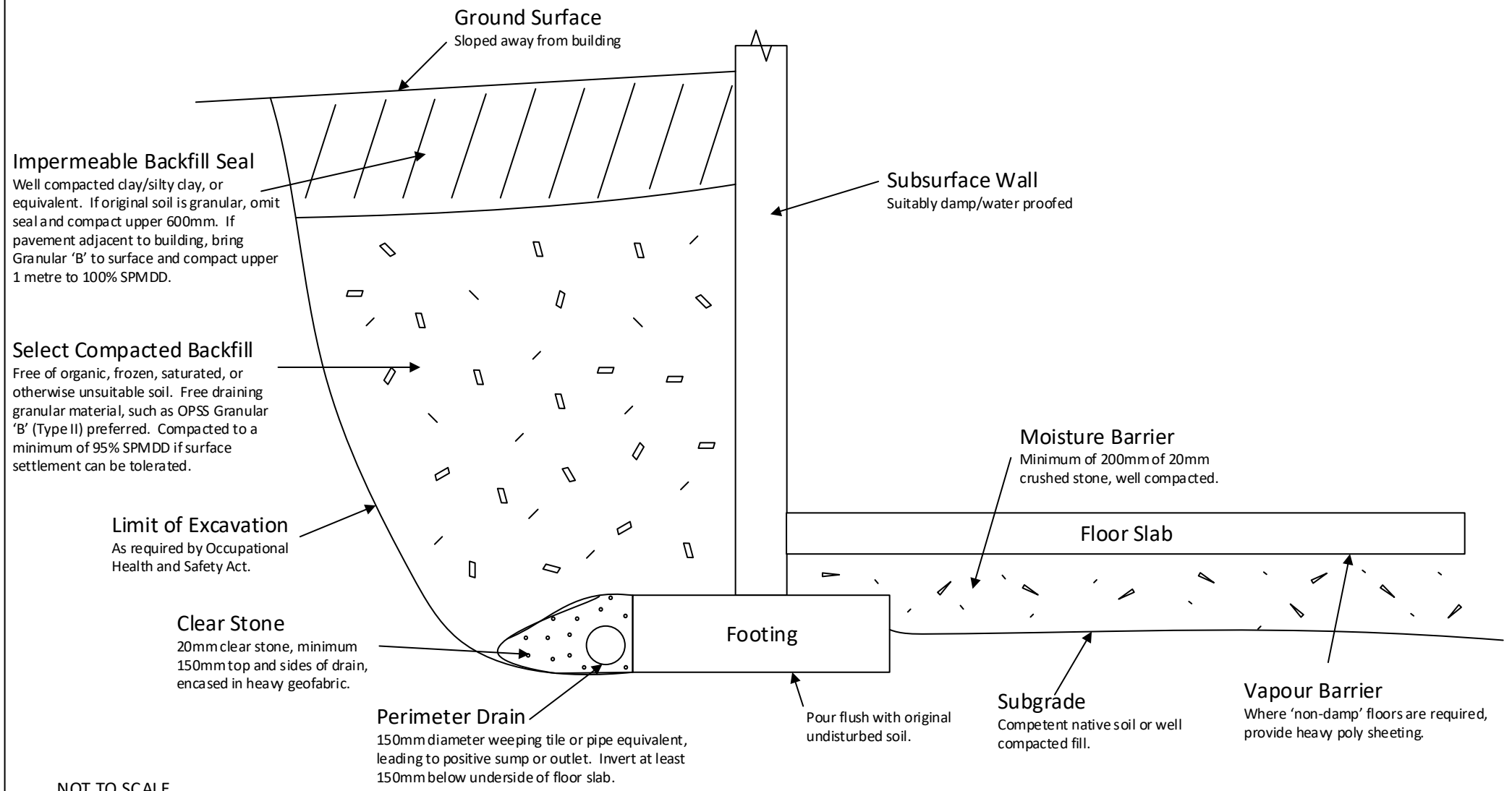


Lab No.:	**21-337**	Notes: Depth: 7.5'	
Sample No.:	**4**		
Borehole No.:	**4**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ traces of Silt and Clay**	
SILT [%]:	**9**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**89**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] : **100 to 150**	Estimated Permeability, k [cm/s] **10^{-3} to 10^{-2}**
D_{10} (Effective Diam. in mm):	**0.0600**	Coefficient of Uniformity C_U: **3.7**	Coefficient of Curvature C_C: **1.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 3**	**Project No.: SM 301951-T**



NOT TO SCALE

Soil-Mat

Soil-Mat Engineers & Consultants Ltd.

Project No.:	SM 301951-G
Date:	September 2021

Typical Design Requirements
Drainage and Backfill for Basement Walls

Drawing No. 2

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

Hamilton: 130 Lancing Drive L8W 3A1 T: 905.318.7440 F: 905.318.7455
Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 800.243.1922

PROJECT NO.: SM 301951A-G October 14, 2021

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Marcus Gagliardi
Development Planner

PRELIMINARY GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
7581 SIDEROAD 15
ELORA, ONTARIO

Dear Mr. Gagliardi,

Further to your authorisation and subsequent discussions with Mr. Michael DeBiasio, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has completed the fieldwork, laboratory testing, and report preparation in connection with the above noted project. The scope of work was completed in general accordance with our proposal P301951, dated July 1, 2021, later revised and confirmed through email communication on August 3, 2021. This report should be read in conjunction with the formal report for the Clayton Lands to the west SM 301951B-G, dated October 5, 2021. Our comments and recommendations based on our findings at the seven [7] borehole locations are presented in the following paragraphs.

1. INTRODUCTION

We understand that the project will involve the construction of a residential development consisting of single-family dwellings and townhouses along asphalt paved roadways, including the installation of associated underground municipal services, located at 7581 Sideroad 15 [Gibson Farms] in Elora, Ontario. The purpose of this preliminary geotechnical investigation work was to assess the subsurface soil and groundwater conditions, and to provide our comments and recommendations with respect to the design and construction of the proposed development, from a geotechnical point of view.

SOIL-MAT ENGINEERS was provided with a sub-watershed study that encompasses the surrounding area – including the subject site – prepared by Aquafor Beech Limited, dated February 2008. The results of this investigation have been considered in preparation of this geotechnical report.

This report is based on the above summarised project description, and on the assumption that the design and construction will be performed in accordance with applicable codes and standards. Any significant deviations from the proposed project design may void the recommendations given in this report. If significant changes are made to the proposed design, this office must be consulted to review the new design with respect to the results of this investigation. It is noted that SOIL-MAT ENGINEERS has also conducted Phase One and Two Environmental Site Assessments (ESAs) for the subject site, which have been reported under a separate cover.

2. PROCEDURE

A total of seven [7] sampled boreholes were advanced at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan. The boreholes were advanced using continuous flight power auger equipment on August 5 and 6, 2021 under the direction and supervision of a staff member of SOIL-MAT ENGINEERS & CONSULTANTS LTD., to termination at depths of between approximately 2.1 and 5.2 metres below the existing ground surface.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on all soil samples recovered from the borings. Selected samples were also subjected to laboratory grain size analyses.

Upon completion of drilling, a groundwater monitoring well was installed at Borehole No. 4 to allow for the future monitoring of the groundwater level. The monitoring well consisted of 50-millimetre PVC pipe screened in the lower 1.5 metres. The monitoring well was encased in well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite ‘hole plug’ to the surface and fitted with a protective steel ‘stick up’ casing. The remaining boreholes were backfilled in general accordance with

Ontario Regulation 903, and the ground surface was reinstated even with the surrounding grade.

The boreholes were located in the field by representatives of SOIL-MAT ENGINEERS, based on accessibility over the site, clearance of underground utilities, and the drawing that was forwarded to our office. Best efforts were made to minimize crop damage by locating the majority of the boreholes to the perimeter of the fields. The ground surface elevation at the borehole locations has been referenced to a geodetic benchmark, described as North American 1983 CSRS, as per the survey plan completed by POI Aerial, dated August 10, 2021, which was provided to our office.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 1 to 7, inclusive, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed at the exact depths of geological change.

3. SITE DESCRIPTION AND SUBSURFACE CONDITIONS

The subject site is currently an undeveloped agricultural property located at 7581 Sideroad 15 in Elora, Ontario. There is a single-family dwelling and an existing barn structure near the middle of the site, setback approximately 200 metres from Sideroad 15. The parcel is bordered to the south by an existing agricultural field, to the east by Gerrie Road, to the north by Sideroad 15, and to the west by Irvine Street, assuming a north-south orientation of Irvine Street. The field is bisected by a tributary of the Irvine Creek – a ditch-like drainage feature – at the north eastern portion of the site. West of the tributary, the two parcels generally slope down to the north, with a relief of approximately 6 metres, as measured across the boreholes. The grade is relatively flat and even with Gerrie Road on the east side of the tributary descending towards the creek with an approximate relief of 15 metres measured across the boreholes.

The subsurface conditions encountered at the borehole locations are summarised as follows:

Topsoil

A surficial veneer of topsoil approximately 150 to 250 millimetres in thickness was encountered at all borehole locations. It is noted that the depth of topsoil may vary across the site and from the depths encountered at the borehole locations. It is also noted that the term 'topsoil' has been used from a geotechnical point of view, and does not necessarily reflect its nutrient content or ability to support plant life. Given the property has been historically used for agricultural purposes the upper levels of the soils would be expected to have a reworked nature resulting in more variable depths of topsoil over the site. As such, it is recommended that a conservative approach be taken when estimating topsoil quantities across the site for stripping, i.e. account for slightly greater stripping depth than those specifically noted at the borehole locations.

Sandy Silt/Clayey Silt

Native sandy silt/clayey silt was encountered beneath the topsoil in the majority of the boreholes, and beneath a sand deposit in Borehole Nos. 3 and 6. The fine-grained granular to slightly cohesive soils were brown in colour, transitioning to grey below about 2.5 metres in Borehole No. 2, with trace to some clay and gravel, with a notable increasing clay content with depth in some of the boreholes. The native sandy silt/clayey silt soils were generally noted to have a reworked or weathered appearance in the upper levels, and were generally noted to have a loose to compact state. The sandy silt/clayey silt deposit was present to depths of approximately 1.1 to 1.9 metres in Borehole Nos. 1 and 4, and was proven to termination at depths of approximately 2.1 to 3.7 metres below the existing ground surface in Borehole Nos. 2, 3, 5, 6, and 7.

Sand

A native sand deposit was encountered beneath the topsoil in Borehole Nos. 3 and 6, and beneath the sandy silt/clayey silt layer in Borehole Nos. 1 and 4. The fine to medium grained soils were brown in colour, with a noted to transition to grey at a depth of approximately 4.8 metres in Borehole No. 4, contained trace amounts of clay, silt, and gravel, and was generally in a compact to dense state. The native sand soils were proven to a depth of approximately 1.5 and 1.8 metres within Borehole Nos. 3 and 6, and proven to termination at depths of between approximately 3.6 and 5.2 metres below the existing ground surface in Borehole Nos. 1 and 4.

Grain Size Analyses

Grain size analyses were conducted on three [3] selected samples of the native soils recovered from the boreholes. The results of this grain size testing can be found appended to the end of this report, and are summarized as follows:

TABLE A
GRAIN SIZE ANALYSES

Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH3 SS3	1.5 m	22	44	28	6	10^{-7}	<10
BH4 SS5	3.0 m	2	7	80	11	10^{-2}	150 to 300
BH6 SS5	3.0 m	11	44	36	9	10^{-6}	10 to 15

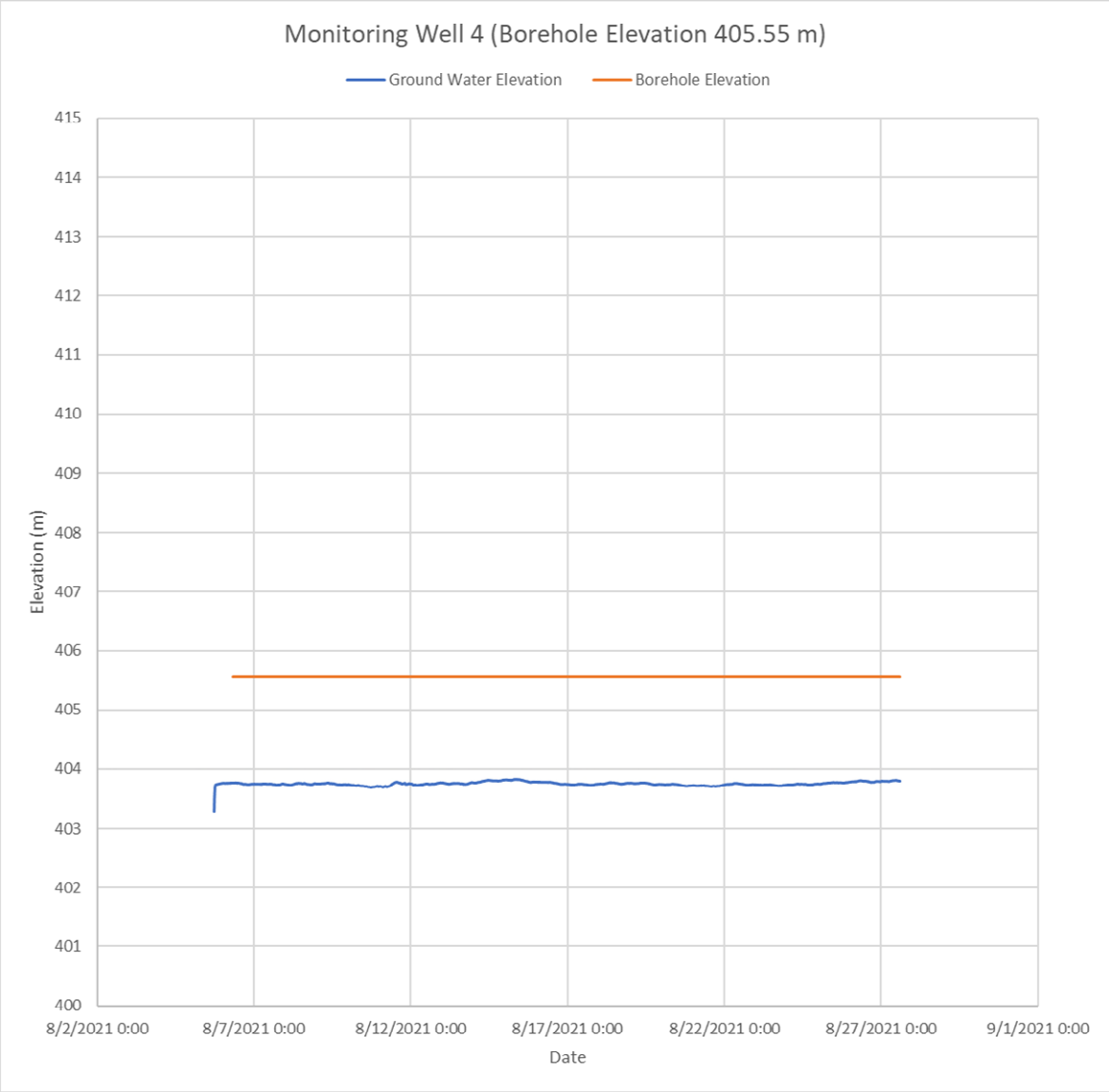
The field and laboratory testing demonstrate the native soils to generally consist of a sandy silt/clayey silt with some clay and traces of gravel in the upper levels, transitioning to a highly permeable sand with traces of clay, silt, and gravel at depth. According to the Unified Soil Classification System (USCS), the soils are classified as M.L. – inorganic silts and very fine sands, clayey silts with slight plasticity in the upper levels overlying S.P. – poorly graded sands, with little to no fines at depth. The sandy silt/clayey silt in the upper levels would generally behave as a low permeable material, but would not be considered as an impermeable material, and would be highly frost susceptible. The underlying sand deposit is highly permeable, relatively free draining.

A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soils to be in areas noting to consist of stone-poor sandy silt to silty sand-textured till, ice-contact stratified deposits of sand and gravel, with minor silt and clay, as well as river deposits of coarse gravel. These conditions are consistent with the observations during drilling.

Groundwater Observations

Borehole No. 6 was noted to have 'caved' to a depth of approximately 2.4 metres and 'wet' at a depth of approximately 2.0 metres, while Borehole No. 4 was noted to be open and 'wet' at a depth of 2.7 metres upon completion. Borehole Nos. 1 was noted to have cave to a depth of 1.5 metres, and dry upon completion. The remainder of the boreholes were noted as being open and 'dry' [i.e. no free groundwater present] upon completion of drilling. It is noted that insufficient time would have passed for the static groundwater level to stabilise in the open boreholes.

As noted above, a monitoring well was installed at Borehole No. 4, to allow for future measurements of the static groundwater level. Furthermore, it is noted that 3 additional monitoring wells were installed on the abutting parcel of land to the west, the work of which was completed in concert with the fieldwork on the Gibson Farm lands. A data logger was installed in Borehole No. 4 to allow for continuous monitoring of the groundwater level between August 6 and August 27, 2021, the readings of which have been illustrated in the following graph:


Monitoring Well 4 (Borehole Elevation 405.55 m)
Ground Water Elevation
Borehole Elevation
Elevation (m)
415
414
413
412
411
410
409
408
407
406
405
404
403
402
401
400
8/2/2021 0:00
8/7/2021 0:00
8/12/2021 0:00
8/17/2021 0:00
8/22/2021 0:00
8/27/2021 0:00
9/1/2021 0:00
Date

In addition to this, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on August 6 and August 27, 2021 and have been summarized in the following chart:

TABLE B
SUMMARY OF GROUNDWATER LEVELS

Monitoring Well	Ground Surface Elevation [m]	August 6, 2021		August 27, 2021	
		Groundwater Depth [m]	Groundwater Elevation [m]	Groundwater Depth [m]	Groundwater Elevation [m]
MW4	405.55	2.74	402.81	1.75	403.80

The groundwater level observed at this monitoring well location, as well as the monitoring wells installed on the adjacent property [summarised in our geotechnical report SM 301951B-G under a separate cover] indicate a groundwater level on the order of approximately 2 to 7 metres below the existing grade, at an elevation of roughly 403.8 to 410.5 metres, varying with the physical topography, and shallower closer the tributary. As noted above this estimate is based on the groundwater data collected from Borehole No. 4, as well as the monitoring wells installed on the Clayton Lands to the west. There is an evident drop in the groundwater level from southwest to northeast, generally following the topography towards the Irvine Creek Tributary. It is noted that the groundwater level would be expected to fluctuate seasonally. It is also noted that the observed groundwater levels may be influenced by more localised shallower 'perched' deposits in more permeable seams within the sandy silt/clayey silt. Further long-term monitoring may allow for a more accurate estimate of the static groundwater level, including more data during the 'wet' and 'dry' seasons.

As noted above, SOIL-MAT ENGINEERS was also provided a sub-watershed study by Aquafor Beech, which included a number of monitoring wells to the east to monitor the groundwater elevations. The conditions and groundwater levels described in this geotechnical report are consistent with those encountered during our fieldwork as described above.

General Soil Conditions

As noted above the subsurface conditions are generally characterized as sandy silt/clayey silt deposit in the upper levels, underlain by a permeably cohesionless sand deposit. The grain size analyses indicate the sandy silt/clayey silt soils to have 10 to 20 percent clay content, lending a slightly cohesive characteristic. The sandy silt/clayey silt soils are relatively consistent in terms of its constituents but are noted to contain an increasing clay content with depth in some of the boreholes, as noted above. Where the material transitions into a sand the native soils are generally fine in gradation in the upper levels, becoming medium to coarse with depth. As demonstrated above the subsurface conditions exhibit a relatively inconsistent layered structure across the large area, but can be generally distinguished by a layer of slightly cohesive sandy silt overlying a cohesionless sand. The conditions will be best assessed during excavations on an area-by-area basis. As such it may also be prudent to advance a series of test excavations in the area of proposed deeper excavations and/or stormwater management ponds to confirm soil composition and groundwater conditions in the area of deep excavations.

4. EXCAVATIONS

Excavations for the installation of foundations and underground services are anticipated to extend to depths of up to approximately 2 to 5 metres below the existing grade. Excavations through the native sandy silt/clayey silt and sand soils, as well as any engineered fill placed as part of site grading works, should be relatively straightforward, with the sides remaining stable for short construction periods at inclinations of up to 45 degrees to the horizontal, and possibly steeper depending on moisture condition and clay content. Where wet or more permeable seams are encountered, during periods of extended precipitation, or where excavations extend below the static groundwater level, the sides of excavations should be expected to ‘slough in’ to as flat as 3 horizontal to 1 vertical, or flatter.

Nevertheless, all excavations must comply with the current Occupational Health and Safety Act and Regulations for Construction Projects. The native sandy silt/clayey silt and sand soils would generally be considered a Type 2 or 3 soil, depending on the moisture content and relative compact to dense condition, as outlined in the Ontario Health and Safety Act III – Excavations. Excavation slopes steeper than those required in the Safety Act must be supported and a senior geotechnical engineer from this office should monitor the work.

As noted above, the groundwater level varies between depths of approximately 2 to 7 metres below the existing grade, roughly elevation 403.8 to 410.5 metres. The majority of excavations are anticipated to be above the groundwater level. Nevertheless, some infiltration of water from more permeable seams and surface runoff into the open excavations should be anticipated. Such infiltration should be readily controlled using typical construction dewatering methods. 'Perched' deposits of water may be encountered within more permeable pockets, which may require greater initial dewatering efforts and instability in the excavations, especially during the 'wet' times of the year. Where excavations extend to greater depths, to and below the groundwater level, especially within the sand deposit, the rate of infiltration will be much greater and additional pumping or more sophisticated dewatering methods should be anticipated. In this regard, ongoing monitoring of the groundwater levels, and careful review of the design servicing elevations, is recommended. As noted above, the advancement of test excavations in the area of proposed deep services and stormwater management ponds would allow for a first hand look at how groundwater levels may affect such excavations. More water should be expected when connections are made to existing services. Surface water should be directed away from the excavations.

The base of the excavations in the native soils, above the groundwater level, encountered in the boreholes should generally remain firm and stable. Where excavations extend to greater depths, to or below the groundwater level, or where 'perched' water is encountered, some base instability should be expected, especially during 'wet' times of the year. This will be especially likely in the high silt content sandy silt/clayey silt soils. Areas of base instability may be stabilised with the placement of additional bedding or ballast stone, the use of coarser stone material, etc. The appropriate measures are best assessed based on the actual conditions at the time of construction. With a firm and stable base condition, stabilised where warranted, standard pipe bedding material as specified by the Ontario Provincial Standard Specification [OPSS] or County of Wellington should be satisfactory. The bedding should be well compacted to provide sufficient support to the pipes and components (i.e. valve chambers, manholes etc.), and to minimize settlements of the roadway above the service trenches. Special attention should be paid to compaction under the pipe haunches.

We recommend that the invert elevations of any storm sewer pipes for rear yard catch basins be located above the proposed underside of footing elevations of adjacent residential structures, or that the trench excavations should be filled with 5 MPa 'lean mix' concrete product to the proposed underside of footing level where the excavations

extend below an imaginary 10 horizontal to 7 vertical line extending outwards and down from a point 0.3 metres beyond the proposed townhouse foundations.

Any utility poles, light poles, etc. located within 3 metres of the top of an excavation slope should be braced to ensure their stability. Likewise, temporary support might be required for other existing above and below ground structures, including existing underground services, roadways, etc. depending on their proximity to the trench excavations.

5. BACKFILL CONSIDERATIONS

The excavated material will consist primarily of the sandy silt/clayey silt and sand soils encountered in the boreholes as described above. These soils are generally considered suitable for use as engineered fill, trench backfill, etc., provided that they are free of organics, construction debris, or other deleterious material, and that its moisture content can be controlled to within 3 per cent of its standard Proctor optimum moisture content.

It is noted that the sandy silt/clayey silt soils encountered are not considered to be free draining and should not be used where this characteristic is necessary. It is also noted that these fine grained granular soils will present difficulties in achieving effective compaction when they become 'wet' of optimum, and where access with compaction equipment is restricted. The sandy silt/clayey silt soils encountered are generally considered to be near to slightly 'dry' of their standard Proctor optimum moisture content, with some noted 'wet' seams. Some moisture conditioning will be required depending upon the weather conditions at the time of construction. It is noted that these silty soils will become nearly impossible to compact when wet of its optimum moisture content. Any material that becomes wet to saturated should be spread out to allow to dry, or removed and discarded, or utilised in non-settlement sensitive areas. The sand soils are generally well draining, and tend to be near optimum moisture content. At depth, approaching or below the water level, the sand soils will be expected to be saturated, requiring time to drain excess moisture or other drying efforts in order to achieve effective compaction.

We note that where backfill material is placed near or slightly above its optimum moisture content, the potential for long term settlements due to the ingress of groundwater and collapse of the fill structure is reduced. Correspondingly, the shear strength of the 'wet' backfill material is also lowered, thereby reducing its ability to support construction traffic and therefore impacting roadway construction. If the soil is

well dry of its optimum value, it will appear to be very strong when compacted, but will tend to settle with time as the moisture content in the fill increases to equilibrium condition. The fine grained to cohesive soils encountered may require high compaction energy to achieve acceptable densities if the moisture content is not close to its standard Proctor optimum value. It is therefore very important that the moisture content of the backfill soils be within 3 per cent of its standard Proctor optimum moisture content during placement and compaction to minimise long term subsidence [settlement] of the fill mass. Any imported fill required in service trenches or to raise the subgrade elevation should have its moisture content within 3 per cent of its optimum moisture content and meet the necessary environmental guidelines.

A representative of SOIL-MAT should be present on-site during the backfilling and compaction operations to confirm the uniform compaction of the backfill material to project specification requirements. Close supervision is prudent in areas that are not readily accessible to compaction equipment, for instance near the end of compaction 'runs'. Backfill within service trenches, areas to be paved, etc., should be placed in loose lifts not exceeding 300 millimetres in thickness and compacted to a minimum of 95 per cent of its standard Proctor maximum dry density [SPMDD], and to 100 per cent of its SPMDD in the upper 1 metre below the design subgrade level. All structural fill should be compacted to 100 per cent of its SPMDD. The appropriate compaction equipment should be employed based on soil type, i.e. pad-toe for cohesive soils and smooth drum/vibratory plate for granular soils. A method should be developed to assess compaction efficiency employing the on-site compaction equipment and backfill materials during construction.

6. MANHOLES, CATCH BASINS AND THRUST BLOCKS

Properly prepared bearing surfaces for manholes, valve chambers, etc. in the native competent soils, stabilised where required, will be practically non-yielding under the anticipated loads. Proper preparation of the founding soils will tend to accentuate the protrusion of these structures above the pavement surface if compaction of the fill around these structures is not adequate, causing settlement of the surrounding paved surfaces. Conversely, the pavement surfaces may rise above the valve chambers and around manholes under frost action. To alleviate the potential for these types of differential movements, free-draining, non-frost susceptible material should be employed as backfill around the structures located within the paved roadway limits, and compacted to 100 per cent of its standard Proctor maximum dry density. A geofabric separator

should be provided between the free draining material and the on-site silt soils to prevent the intrusion of fines.

The thrust blocks in the native soils or engineered fill may be conservatively sized as recommended by the applicable Ontario Provincial Standard Specification conservatively using a horizontal allowable bearing pressure of up to 150 kPa [~2,000 psf]. Any backfill required behind the blocks should be a well-graded granular product and should be compacted to 100 per cent of its standard Proctor maximum dry density.

7. PAVEMENT STRUCTURE DESIGN CONSIDERATIONS

All areas to be paved must be cleared of all organic and otherwise unsuitable materials, and the exposed subgrade proof rolled with 3 to 4 passes of a loaded tandem-axle truck in the presence of a representative of SOIL-MAT ENGINEERS & CONSULTANTS LTD., immediately prior to the placement of the sub-base material. Any areas of distress revealed by this or other means should be subexcavated and replaced with suitable backfill material. Where the subgrade condition is poorer it may be necessary to implement more aggressive stabilisation methods, such as the use of coarse aggregate [50-millimetre clear stone, 'rip rap', etc.] 'punched' into the soft areas.

Good drainage provisions will optimise the long-term performance of the pavement structure. The subgrade must be properly crowned and shaped to promote drainage to the subdrain system. Subdrains should be installed to intercept excess subsurface water and to prevent softening of the subgrade material. Surface water should not be allowed to pond adjacent to the outer limits of the paved areas.

The most severe loading conditions on the subgrade typically occur during the course of construction, therefore precautionary measures may have to be taken to ensure that the subgrade is not unduly disturbed by construction traffic. SOIL-MAT should be given the opportunity to review the final pavement structure design and subdrain scheme prior to construction to ensure that they are consistent with the recommendations of this report.

If construction is conducted under adverse weather conditions, additional subgrade preparation may be required. During wet weather conditions, such as during the fall and spring months, it should be anticipated that additional subgrade preparation will be required, such as additional depth of Ontario Provincial Standard Specification [OPSS] Granular 'B', Type II (crushed limestone bedrock) sub-base material. It is also important

that the sub-base and base granular layers of the pavement structure be placed as soon as possible after exposure, preparation and approval of the subgrade level.

The roadways through the residential subdivision would be required to adequately support cars, trucks and intermittent delivery and garbage trucks. A typical generic pavement structure would consist of 350 millimetres of OPSS Granular 'B', Type II (crushed bedrock) sub-base course, 150 millimetres of OPSS Granular 'A' base course, 60 millimetres of HL8 or HL4 binder course asphaltic concrete, and 40 millimetres of HL3 surface course asphaltic concrete. Where a pit run, Granular B Type I, aggregate is utilised in the granular base, it should be increased to a minimum thickness of 450 millimetres. It is our opinion that this design is suitable for use on a residential roadway section, provided that the subgrade has been prepared as specified and is good and firm before the sub-base course material is placed. Notwithstanding, the pavement structure should conform to the relevant County of Wellington requirements where they are to be assumed by the County. If the subgrade is soft, remedial measures as discussed above may have to be implemented and/or the sub-base thickness may have to be increased. The granular sub-base and base courses and asphaltic concrete layers should be compacted to OPSS or County of Wellington requirements. A program of in-place density testing must be carried out to monitor that compaction requirements are being met. We note that this pavement structure is not to be considered as a construction roadway design.

To minimise segregation of the finished asphalt mat, the asphalt temperature must be maintained uniform throughout the mat during placement and compaction. All too often, significant temperature gradients exist in the delivered and placed asphalt with the cooler portions of the mat resisting compaction and presenting a honeycomb surface. As the spreader moves forward, a responsible member of the paving crew should monitor the pavement surface, to ensure a smooth uniform surface. The contractor can mitigate the surface segregation by 'back-casting' or scattering shovels of the full mix material over the segregated areas and raking out the coarse particles during compaction operations. Of course, the above assumes that the asphalt mix is sufficiently hot to allow the 'back-casting' to be performed.

Asphalt paving of driveways should be consistent with the general recommendations provided above. Proper preparation of the subgrade soils is essential to good long-term performance of the pavement. Likewise, sufficient depth and compaction of granular base materials and adequate drainage will be important in achieving good long-term performance, i.e. preventing/limiting premature cracking, subgrade failure, rutting, etc. A typical recommended light duty pavement structure for residential driveways would

consist of a minimum of 200 millimetres of OPSS Granular 'A' base course, compacted to 100 percent standard Proctor maximum dry density, followed by a minimum of 50 millimetres of HL3 or HL3F asphaltic concrete, compacted to a minimum of 92 per cent of their Marshall maximum relative density [MRD].

8. HOUSE AND TOWNHOUSE CONSTRUCTION

The native soils encountered at the borehole locations are considered capable of supporting the loads associated with typical residential dwelling and townhouse structures on conventional spread footings, below any fill, organic, or otherwise unsuitable materials. Bearing pressures of up to 150 kPa [~3,000 psf] SLS and 225 kPa [~4,500 psf] ULS may be considered in the competent native soils. In areas where 'wet' seams are present, or the native soils present in less compact condition, reduced bearing values of 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] are recommended. The founding surfaces must be hand cleaned of any loose or disturbed material, along with any ponded water, immediately prior to placement of foundation concrete.

In the event that site grading works result in engineered fill below founding elevations, the general recommendations presented in the Backfill Considerations above should be strictly adhered to, with compaction to 100 percent standard Proctor maximum dry density, verified by monitoring and testing by a representative of SOIL-MAT ENGINEERS present on a full time basis. If there is a short fall in the volume of fill required, then the source of imported fill should be reviewed for gradation, Proctor value, compatibility with existing fill, environmental characteristics and be approved by this office prior to use. The design bearing capacity for footings within the engineered fill should be limited to 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] ULS.

The support conditions afforded by the native soils and/or engineered fill are generally not uniform across the building footprint, nor are the loads on the various foundation elements. As such it is recommended that consideration be given to the provision of nominal reinforcement in the footings and foundation walls to account for variable support and loading conditions. The use of nominal reinforcement is considered good construction practice as it will act to reduce the potential for cracking in the foundation walls due to minor settlements, heaving, shrinkage, etc. and will assist in resisting the pressures generated against the foundation walls by the backfill. Such nominal reinforcement is an economical approach to the reduction and prevention of costly foundation repairs after completion and later in the life of the buildings. This

reinforcement would typically consist of two continuous 15M steel bars placed in the footings [directly below the foundation wall], and similarly two steel bars placed approximately 300 millimeters from the top of the foundation walls at a minimum, depending on ground conditions exposed during construction. These reinforcement bars would be bent to reinforce all corners and under basement windows, and be provided with sufficient overlap at staggered splice locations. At 'steps' in the foundations and at window locations, the reinforcing steel should transition diagonally, rather than at 90 degrees, to maintain the continuous tensile capacity of the reinforcement. Where footings are founded on, or partially on, engineered fill the above provision for nominal reinforcement would be required.

All basement foundation walls should be suitably damp proofed, including the provision of a 'dimple board' type drainage product, and provided with a perimeter drainage tile system outlet to a gravity sewer connection or positive sump pit a minimum of 150 millimetres below the basement floor slab. The clear stone material surrounding the weeping tile should be encased with a geotextile material to prevent the migration of fines from the foundation wall backfill into the clear stone product. In the event that sump pit systems are required we would recommend that the sump pump system should be constructed with an 'oversized' reservoir and a 'back-flow' prevention valve so that the sump pump will not cycle repeatedly within short time periods.

All footings exposed to the environment must be provided with a minimum of 1.2 meters of earth or equivalent insulation to protect against frost penetration. This frost protection would also be required if construction were undertaken during the winter months. All footings must be proportioned to satisfy the requirements of the Ontario Provincial Building Code.

It is imperative that a soils engineer be retained from this office to provide geotechnical engineering services during the excavation and foundation construction phases of the project. This is to observe compliance with the design concepts and recommendations outlined in this report, and to allow changes to be made in the event that subsurface conditions differ from the conditions identified at the borehole locations.

9. PRELIMINARY HYDROGEOLOGICAL CONSIDERATIONS

As noted above, it is understood that the development will consist of single family dwellings and townhouse blocks, including the installation of associated underground municipal services along asphalt paved roadways. Excavations for the proposed development services are expected to extend to depths of up to approximately to 2 to 5 metres below the existing ground surface, while excavations for foundations would be expected to extend to up to approximately 2 metres. Measurements of the groundwater level at the monitoring well locations indicate a groundwater level on the order of approximately 2 to 7 metres below the existing ground surface, however further groundwater monitoring may be conducted to more accurately assess the static groundwater level.

The short term excavations for the proposed servicing are generally anticipated to extend into the sandy silt/clayey silt and sand soils to depths above the static groundwater level. Such excavations would be expected to be subject to relatively minor groundwater infiltration, such that it should be possibly to adequately control such infiltration using conventional construction dewatering techniques such as pumping from sumps in the base of the excavation. During wet times of year, some instability of the excavations may be experienced. The rate of dewatering would be expected to be below 50,000 L/day, and certainly below 400,000 L/day, such that an EASR or PTTW should not be required. Where deeper excavations are identified to be required, extending below the static groundwater level, the need for temporary dewatering controls during construction should be more closely evaluated. Depending on the proposed depths of excavations for the proposed footings and site services, the rate of dewatering could approach or be greater than 50,000 L/day, potentially requiring an EASR. As such, once available, the site servicing and grading plans detailing depths of construction should be forwarded onto our office for further review and comments.

The generally permeable condition of the native sand deposit present over the site will generally allow for natural drainage and movement of groundwater. As such, it is not considered likely that service trenches would present any conflict or impact to the natural groundwater conditions. As such, the provision of clay ‘cut-offs’ within trench backfill is not expected to be required.

Excavations for the proposed basement levels should be well above the groundwater level, and so would not be expected to require significant ongoing groundwater control, other than typical perimeter weeping tile and sump pump as noted above.

The final grading of the site should appropriately consider the groundwater levels in order to minimise or avoid conflict or impact to the groundwater during and post construction. In this regard the grading and storm water management plan should accommodate surface runoff that follows the existing overall drainage patterns as much as possible.

It is also noted that the use of Low Impact Design [LID] methods as part of the stormwater management for the proposed development would be viable for much of the site and should be considered. The permeable sand deposit, above the groundwater level, would afford an opportunity for natural infiltration of surface runoff, such is in 'dry' ponds, infiltration galleries, etc.

Based on our observations and details of the proposed development, it is not anticipated that the proposed construction will have an adverse impact on the groundwater condition in the area, and further detailed hydrogeological assessment is not considered warranted at this time. As the detailed design of the proposed development proceeds, this office should be consulted to review the hydrogeological conditions and assess the potential for concern, or need for additional study.

10. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

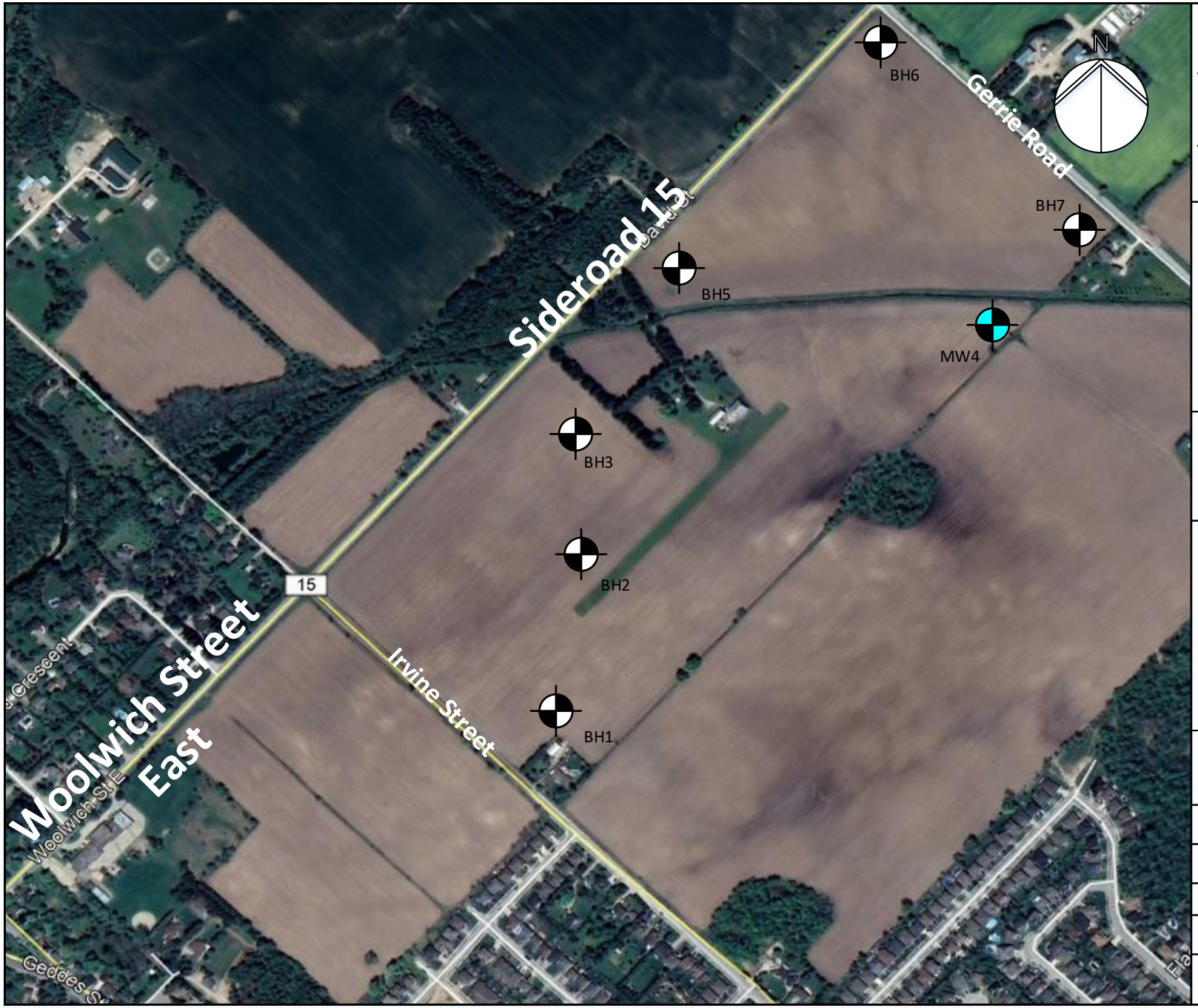
Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Scott Wylie, B.Eng., EIT.

Ian Shaw, P. Eng.
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Log of Borehole Nos. 1 to 7, inclusive
Grain Size Analyses
Drawing No. 2, Recommended Design Requirements for Basement Construction

Distribution: Cachet Developments [pdf]



LEGEND

Borehole Location
BH#

Monitoring Well Location
MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301951A-G.

2. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Sideroad 15
Elora, Ontario

Borehole Location Plan

Project No. SM 301591A-G

Date: September 2021

Drawn: SW	Checked: KR

SM 301591A-G Borehole Location Plan

Drawing No. 1

Log of Borehole No. 1

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838268
E: 545454

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		413.05		Ground Surface								
0	0	412.80		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	4 5 7 6	12			
3	1	411.90		**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, compact.		SS	2	6 7 6 6	13			
6	2			**Sand** Brown, trace clay, silt, and gravel, medium to coarse gradation, compact.		SS	3	5 8 12 14	20			
9	3					SS	4	12 10 13 10	23			
11		409.40				SS	5	6 11 13 15	24			
12	4			End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as dry and caved to a depth of 1.5 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 2

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838469
E: 545516

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	415.00	Ground Surface								
0 / 0	414.80	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	2 4 4 5	8			
3 / 1	413.50	**Sandy Silt** Brown, reworked in upper levels, trace clay, silt, and gravel, loose.		SS	2	4 3 6 8	9			
6 / 2	412.50	**Clayey Silt** Brown, trace to some sand and gravel, stiff to very stiff.		SS	3	6 6 6 7	12		3.5	
8 / 2		Transition to grey.		SS	4	3 7 6 7	13		4.0	
11 / 3	411.30			SS	5	9 7 15 18	22		>4.5	
12 / 4		End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.7 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 3

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838652
E: 545505

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
		409.93		Ground Surface									
0	0			**Topsoil** Approximately 150 millimetres of topsoil.		SS	1	4 6 10 8	16				
3	1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, compact.		SS	2	6 10 10 7	20				
6	2	408.10 407.80		**Sandy Silt** Brown, trace to some gravel and clay, compact.		SS	3	6 8 10 11	18				
				End of Borehole									

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 2.1 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 4

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838792
E: 546044

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		405.55		Ground Surface								
0	0	405.35		**Topsoil** Approximatelty 200 millimetres of topsoil.								
1				**Sandy Silt** Brown, trace to some clay, trace gravel, reworked in upper levels, loose.		SS	1	2 3 5 6	8			
2												
3	1					SS	2	4 3 3 5	6			
4												
5												
6		403.70				SS	3	8 10 12 15	22			
7	2			**Sand** Brown, trace clay, silt, and gravel, medium to coarse gradation, wet, compact to dense.								
8						SS	4	8 10 11 10	21			
9												
10	3					SS	5	8 10 23 30	33			
11												
12												
13	4											
14												
15		400.70										
16	5	400.40		Transition to grey.		SS	6	3 11 18 23	29			
17				End of Borehole								
18												
19												
20	6											
21												
22												
23	7											
24												
25												
26	8											
27												
28												
29	9											

Moisture Content w%
10 20 30 40

Standard Penetration Test blows/300mm
20 40 60 80

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 5, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as open and 'wet' at a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 2.74 metres below ground surface.

August 27, 2021 - 1.75 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 5, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 5

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838939
E: 545636

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.10		Ground Surface								
0	0	411.90		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	2 4 5 7	9			
3	1			**Sandy Silt** Brown, reworked in upper levels, trace to some clay, increasing clay content with depth, occasional gravel, loose to compact.		SS	2	1 3 3 5	6			
6	2	410.00				SS	3	3 5 7 9	12			
				End of Borehole								

NOTES:

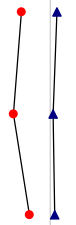
1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 2.1 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Moisture Content w% — 10 20 30 40

Standard Penetration Test blows/300mm — 20 40 60 80



Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 6

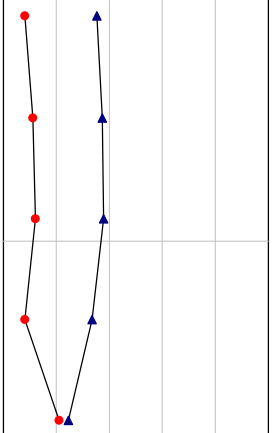
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4839162
E: 545871

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		420.91		Ground Surface								
0	0	420.70		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	4 4 4 4	8			
1				**Sand** Brown, reworked in upper levels, trace rootlets, loose to compact.		SS	2	3 5 6 6	11			
2	1	419.40		**Sandy Silt** Brown, trace clay, increasing clay content with depth, loose to compact.		SS	3	5 6 6 7	12			
3						SS	4	3 4 4 4	8			
4	2	417.30				SS	5	5 11 10 15	21			
5				End of Borehole								
6	3											
7												
8	4											
9												
10	5											
11												
12	6											
13												
14	7											
15												
16	8											
17												
18	9											
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												

Moisture Content w%
10 20 30 40

Standard Penetration Test blows/300mm
20 40 60 80



NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as wet at depth of 2.0 metres, and caved to a depth of 2.4 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 7

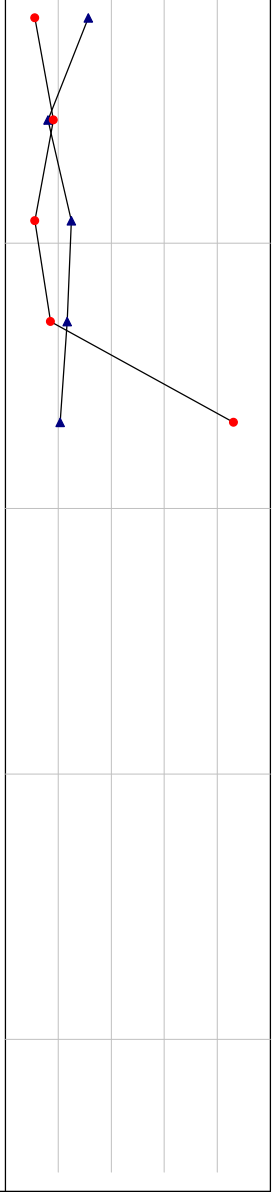
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838910
E: 546126

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	408.39		Ground Surface								
0 / 0	408.10		**Topsoil** Approximately 250 millimetres of topsoil.								
3 / 1	406.90		**Sandy Silt** Brown, trace rootlets, trace clay, reworked in upper levels, increasing clay content with depth, compact.		SS	1	3 5 6 7	11			
					SS	2	10 8 10 10	18			
6 / 2			**Clayey Silt** Brown, trace to some sand and gravel, stiff to hard.		SS	3	3 5 6 6	11		2.0	
9 / 3					SS	4	5 7 10 18	17		2.5	
11 / 3	404.70				SS	5	24 36 50/5"	100		>4.5	
12 / 4			End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.0 metres.

2. Borehole was recorded as open and dry upon completion and backfilled as per Ontario Regulation 903.

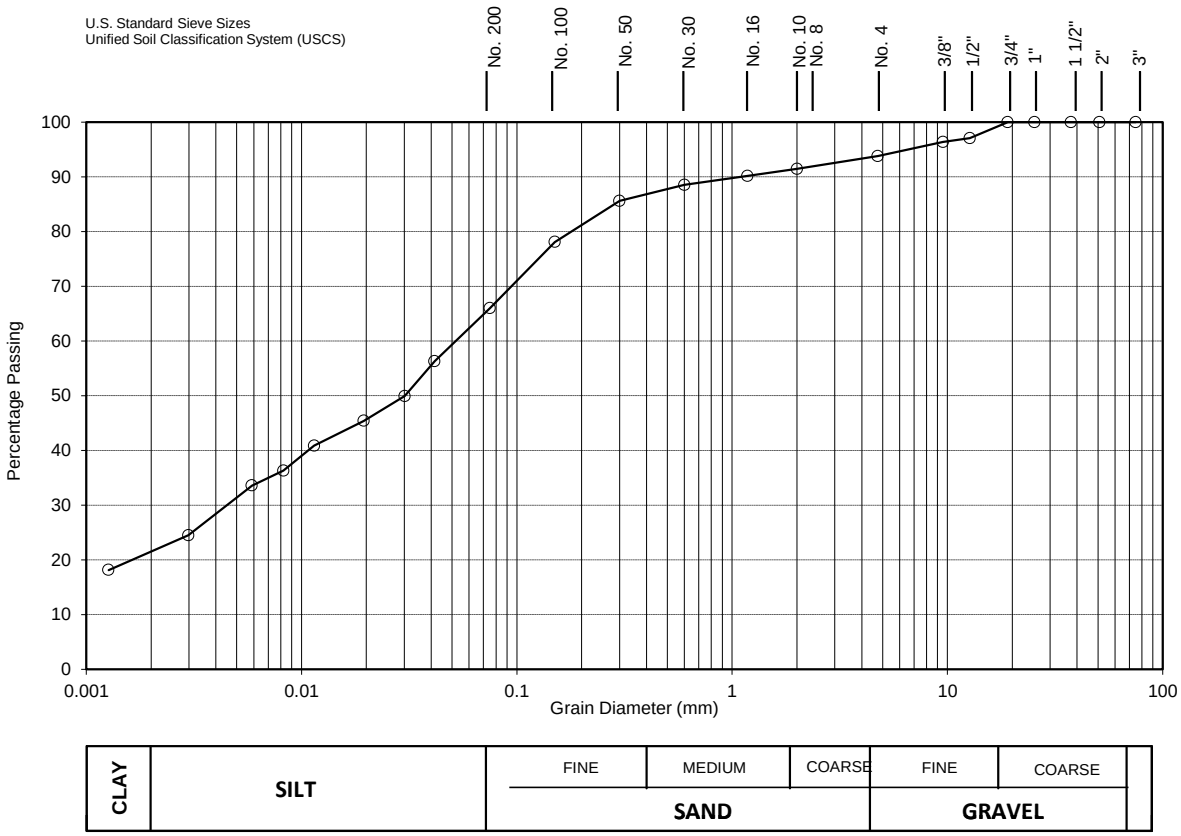
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Mechanical & Hydrometer Analyses



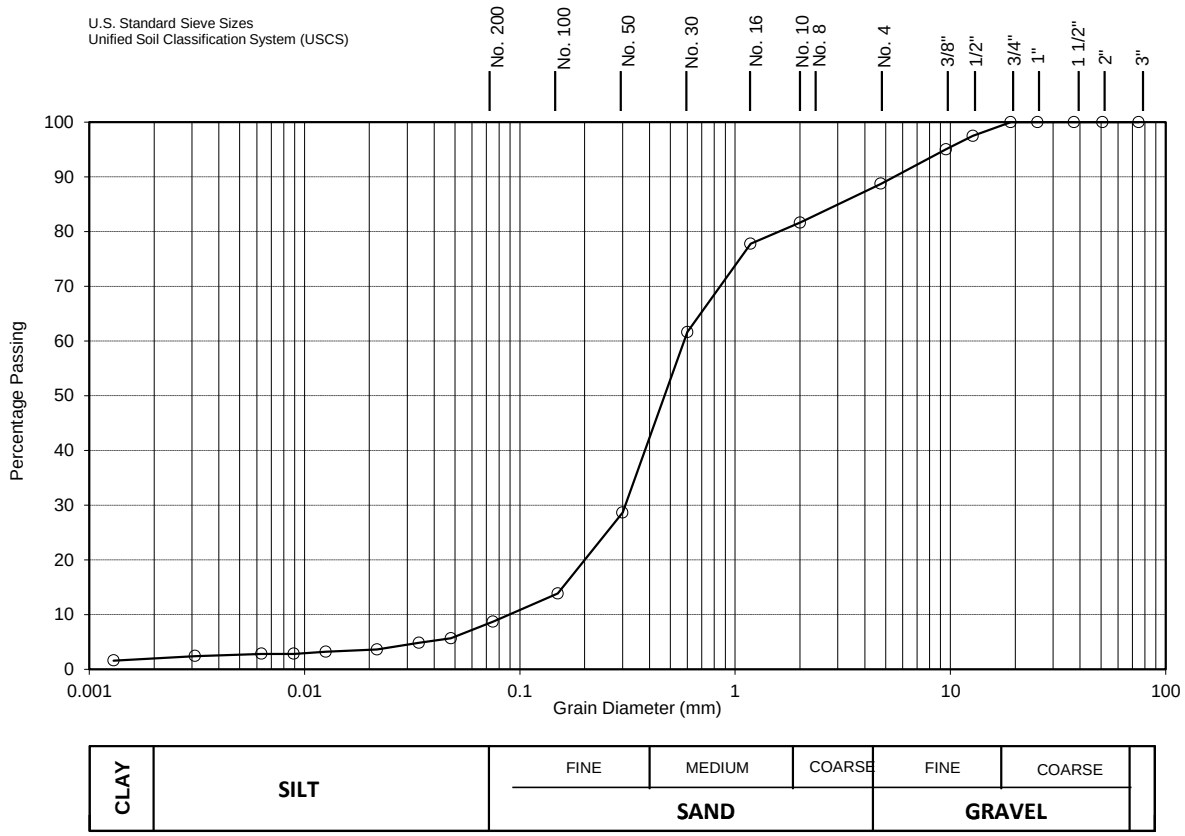
Lab No.:	**21-335**	Notes: Depth: 5'			
Sample No.:	**3**				
Borehole No.:	**3**				
CLAY [%]:	**22**	Soil Description:	**Brown Sandy Silt w/ some Clay and trace Gravel**		
SILT [%]:	**44**		**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**		
SAND [%]:	**28**				
GRAVEL [%]:	**6**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0005**	Coefficient of Uniformity C_U:	**102.0**	Coefficient of Curvature C_C:	**0.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 1**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



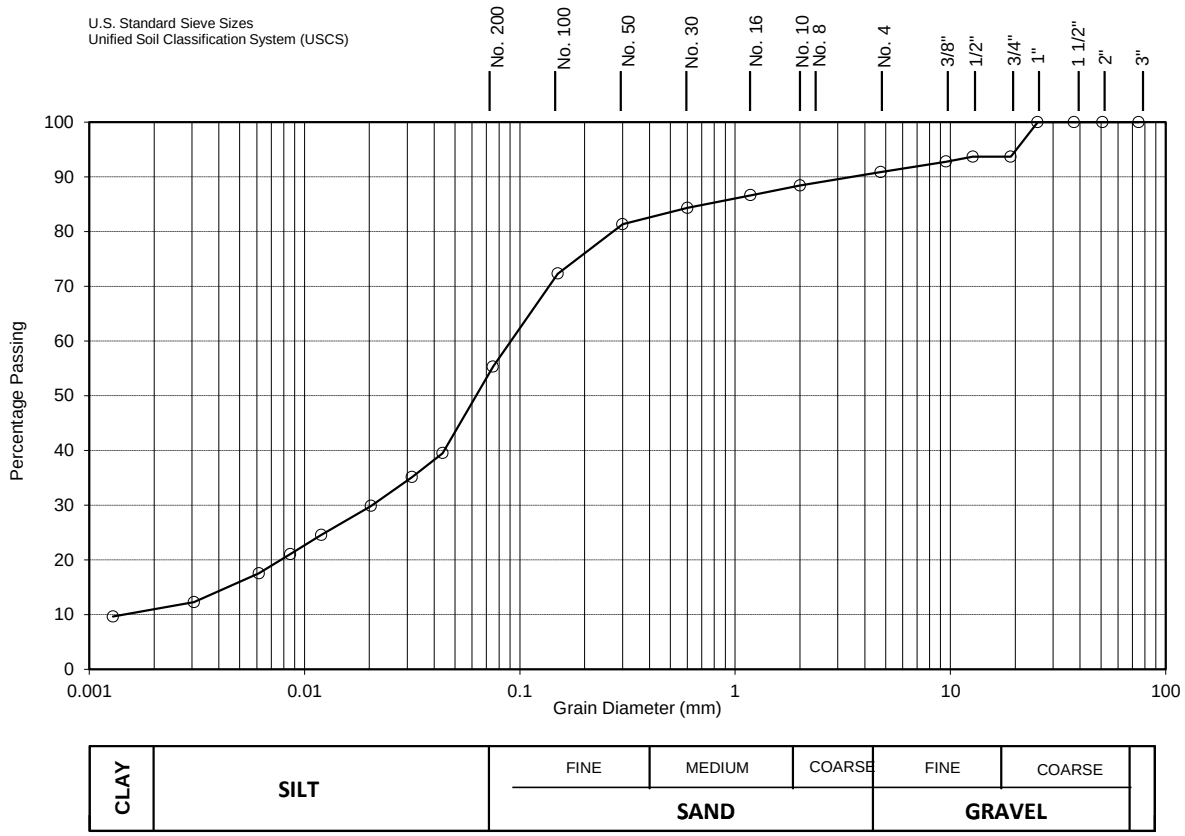
Lab No.:	**21-340**	Notes: Depth: 10'	
Sample No.:	**5**		
Borehole No.:	**4**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ some Gravel and traces of Silt and Clay**	
SILT [%]:	**7**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**80**		
GRAVEL [%]:	**11**	Estimated Infiltration Rate [mm/hr] : **150 to 300**	Estimated Permeability, k [cm/s] **10^{-2}**
D_{10} (Effective Diam. in mm):	**0.090**	Coefficient of Uniformity C_U: **6.6**	Coefficient of Curvature C_C: **1.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 2**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses

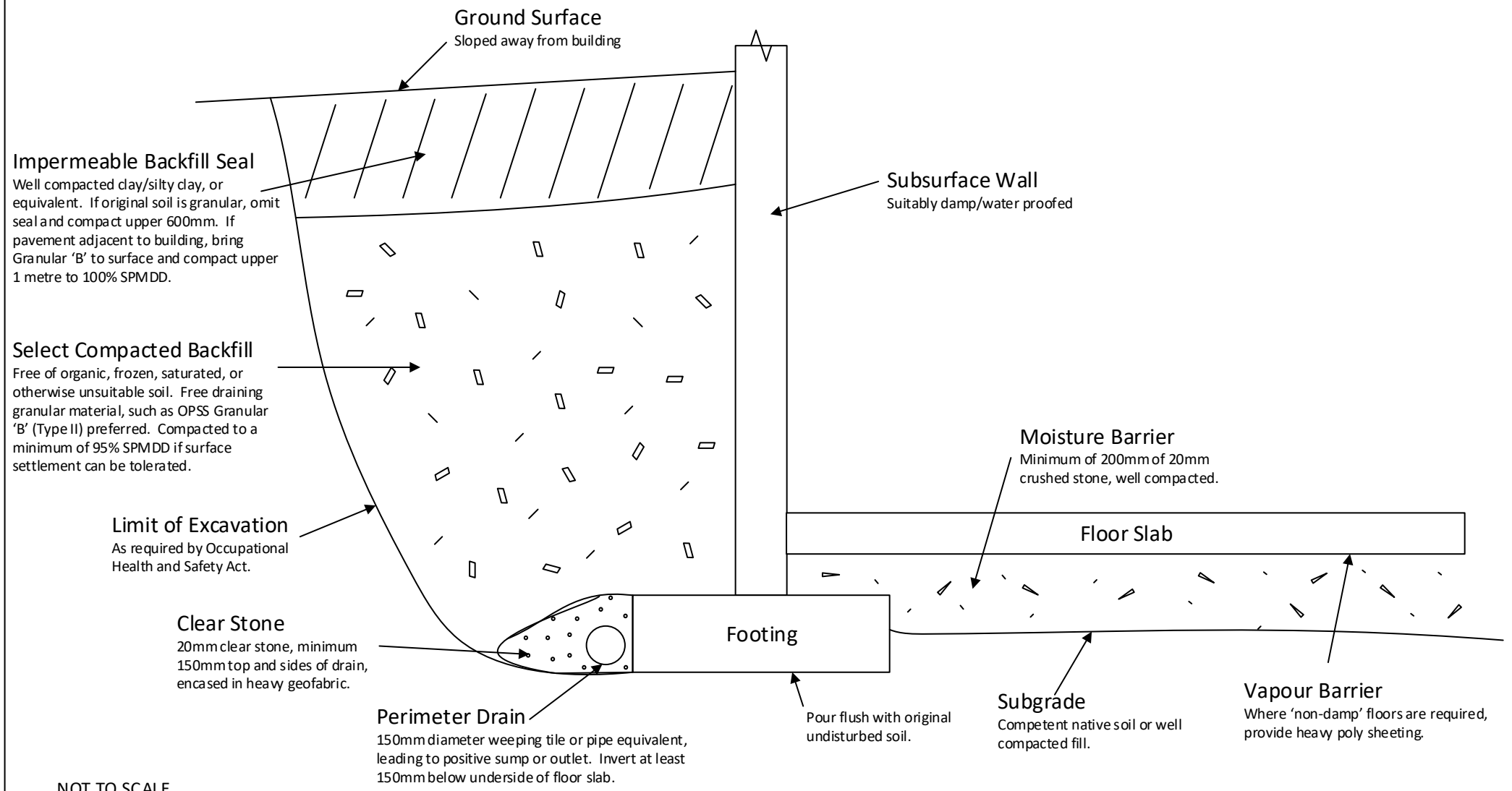


Lab No.:	**21-336**	Notes: Depth: 10'	
Sample No.:	**5**		
Borehole No.:	**6**		
CLAY [%]:	**11**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**44**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**36**		
GRAVEL [%]:	**9**	Estimated Infiltration Rate [mm/hr] : **10 to 15**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0015**	Coefficient of Uniformity C_U: **60.0**	Coefficient of Curvature C_C: **3.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 3**	**Project No.: SM 301951-T**



NOT TO SCALE

Soil-Mat

Soil-Mat Engineers & Consultants Ltd.

Project No.:	SM 301951-G
Date:	September 2021

Typical Design Requirements
Drainage and Backfill for Basement Walls

Drawing No. 2

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

Hamilton: 130 Lancing Drive L8W 3A1 T: 905.318.7440 F: 905.318.7455
Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 800.243.1922

PROJECT NO.: SM 301951-G March 11, 2022

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Marcus Gagliardi
Development Planner

PRELIMINARY HYDROGEOLOGICAL CONSIDERATIONS
PROPOSED RESIDENTIAL DEVELOPMENT
CLAYTON LANDS
ELORA, ONTARIO

Dear Mr. Gagliardi,

Further to your recent correspondence and discussions, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has prepared the following preliminary hydrogeological considerations memo. These comments are further to our Preliminary Geotechnical and Hydrogeological Investigation reports for the subject lands [SM 301951A-G and SM 301951B-G, dated October 14, 2021], and recent discussions with the design team. It is also noted that further more detailed hydrogeological assessment works are presently underway, and will be formally reported once complete.

1. INTRODUCTION

We understand that the project will involve the construction of a residential development on the Clayton Lands located at 75 Woolwich Street East [Clayton Lands] in Elora, Ontario, along with potential future development on the Elora Sands [Gibson Lands] to the east. The development details are to be established, but are anticipated to consist of single-family dwellings and townhouses along asphalt paved roadways, including the installation of associated underground municipal services. The purpose of these preliminary hydrogeological considerations is to provide initial information and comments to support the assessment of site servicing options for the proposed development, from a geotechnical point of view.

2. PROCEDURE

A total of eleven [11] sampled boreholes were advanced at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan. The boreholes were advanced using continuous flight power auger equipment on August 5 and 6, 2021 under the direction and supervision of a staff member of SOIL-MAT ENGINEERS & CONSULTANTS LTD., to termination at depths of between approximately 3.6 and 7.6 metres below the existing ground surface.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on all soil samples recovered from the borings. Selected samples were also subjected to laboratory grain size analyses.

Upon completion of drilling, groundwater monitoring wells were installed at Borehole Nos. 004, 101, 102, and 104 to allow for the future monitoring of the groundwater level. The monitoring well consisted of 50-millimetre PVC pipe screened in the lower 1.5 to 3.0 metres. The monitoring well was encased in well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite 'hole plug' to the surface and fitted with a protective steel 'stick up' casing. The remaining boreholes were backfilled in general accordance with Ontario Regulation 903, and the ground surface was reinstated even with the surrounding grade.

The boreholes were located in the field by representatives of SOIL-MAT ENGINEERS, based on accessibility over the site, clearance of underground utilities, and the drawing that was forwarded to our office. Best efforts were made to minimize crop damage by locating the majority of the boreholes to the perimeter of the fields. The ground surface elevation at the borehole locations has been referenced to a geodetic benchmark, described as North American 1983 CSRS, as per the survey plan completed by POI Aerial, dated August 10, 2021, which was provided to our office.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 001 to 007, and 101 to 104, inclusive, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed at the exact depths of geological change.

3. SITE DESCRIPTION AND SUBSURFACE CONDITIONS

The subject site is currently two [2] undeveloped agricultural properties located at 7581 Sideroad 15 and 75 Woolwich Street East in Elora, Ontario. The eastern parcel, 7581 Sideroad 15, is bordered to the south by an existing agricultural field, to the east by Gerrie Road, to the north by Sideroad 15, and to the west by Irvine Street, assuming a north-south orientation of Irvine Street. The field is bisected by a tributary of the Irvine Creek [Nichol Drain] at the north eastern corner of the site. There is also a single-family dwelling and an existing barn structure near the middle of the site, setback approximately 200 metres from Sideroad 15.

The western parcel, located at 75 Woolwich Street East, is bordered to the east by Irvine Street, to the south by Bricker Avenue, to the west by residential dwellings and a public school, and to the north by Woolwich Street East. West of the tributary, the two parcels generally slope down to the north, with a relief of approximately 6 metres measured across the boreholes. The grade is relatively flat and even with Gerrie Road on the east side of the tributary but quickly descends towards it with an approximate relief of 15 metres measured across the boreholes.

The subsurface conditions encountered at the borehole locations are summarised as follows:

Topsoil

A surficial veneer of topsoil approximately 100 to 250 millimetres in thickness was encountered at all borehole locations. It is noted that the depth of topsoil may vary across the site and from the depths encountered at the borehole locations. It is also noted that the term ‘topsoil’ has been used from a geotechnical point of view, and does not necessarily reflect its nutrient content or ability to support plant life.

Sandy Silt/Clayey Silt

Native sandy silt/clayey silt was encountered beneath the topsoil in the majority of the boreholes, and beneath a sand deposit in Borehole Nos. 003, 006, and 002. The fine-grained granular to slightly cohesive soils were brown in colour, transitioning to grey below about 2.5 metres in Borehole No. 002, with trace to some clay and gravel, with a notable increasing clay content with depth in some of the boreholes. The native sandy silt/clayey silt soils were generally noted to have a reworked or weathered appearance in the upper levels, and were generally noted to have a loose to compact state. The sandy silt/clayey silt deposit was present to depths of approximately 0.9 to 2.2 metres in Borehole Nos. 103, 102, 001 and 004, and was proven to termination at depths of approximately 2.1 to 6.1 metres below the existing ground surface in Borehole Nos. 101, 003, 005, 006, 002, and 007.

Sand

A native sand deposit was encountered beneath the topsoil in Borehole Nos. 003, 006, and 104 and beneath the sandy silt/clayey silt layer in Borehole Nos. 103, 102, 001, and 004. The fine to medium grained soils were brown in colour, with a noted to transition to grey at a depth of approximately 4.8 metres in Borehole No. 10, contained trace amounts of clay, silt, and gravel, and was generally in a compact to dense state. The native sand soils were proven to a depth of approximately 1.5 and 1.8 metres within Borehole Nos. 003 and 006, and proven to termination at depths of between approximately 3.6 and 7.6 metres below the existing ground surface in Borehole Nos. 104, 103, 102, 001 and 004.

Grain Size Analyses

Grain size analyses were conducted on six [6] selected samples of the native soils recovered from the boreholes. The results of this grain size testing can be found appended to the end of this report, and are summarized as follows:

TABLE A
GRAIN SIZE ANALYSES

Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH003 SS3	1.5 m	22	44	28	6	10^{-7}	<10
BH006 SS5	3.0 m	11	44	36	9	10^{-6}	10 to 15
BH104 SS4	2.3 m	2	9	89	0	10^{-3} to 10^{-2}	100 to 150
BH103 SS3	1.5 m	14	45	34	7	10^{-6}	<10
BH102 SS6	4.6 m	2	6	91	1	10^{-2}	150 to 300
BH004 SS5	3.0 m	2	7	80	11	10^{-2}	150 to 300

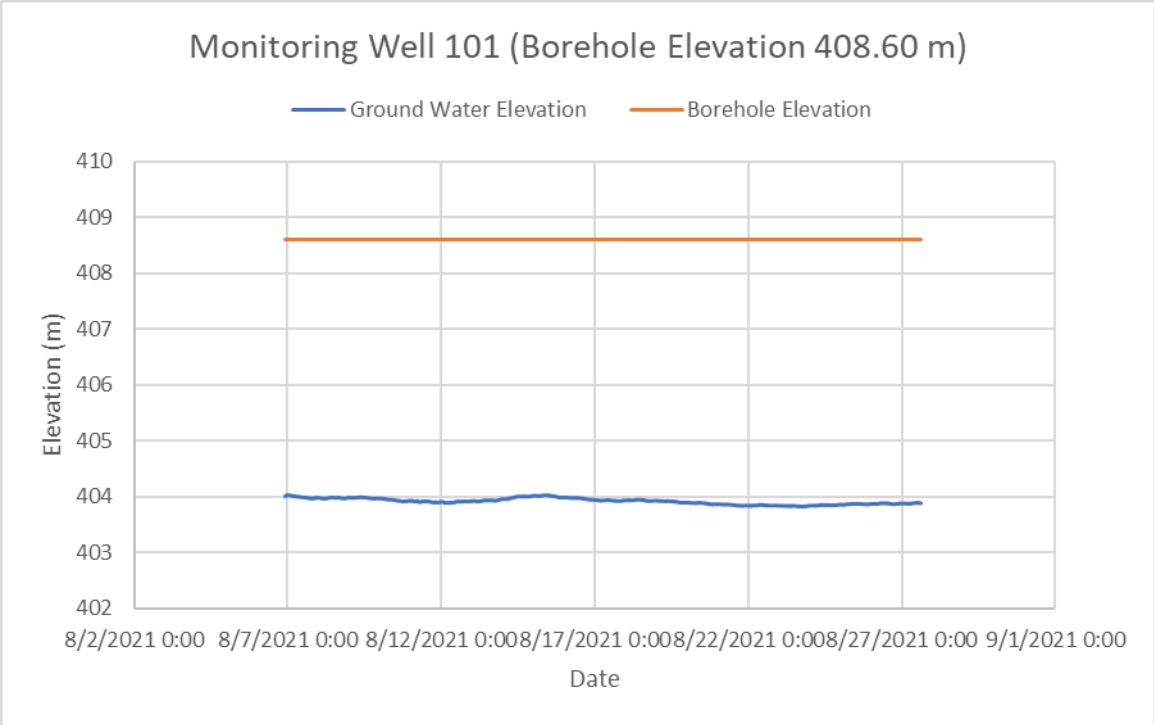
The field and laboratory testing demonstrate the native soils to generally consist of a sandy silt/clayey silt with some clay and traces of gravel in the upper levels, transitioning to a highly permeable sand with traces of clay, silt, and gravel at depth. According to the Unified Soil Classification System (USCS), the soils are classified as M.L. – inorganic silts and very fine sands, clayey silts with slight plasticity in the upper levels overlying S.P. – poorly graded sands, with little to no fines at depth. The sandy silt/clayey silt in the upper levels would generally behave as a low permeable material, but would not be considered as an impermeable material, and would be highly frost susceptible. The underlying sand deposit is highly permeable, relatively free draining.

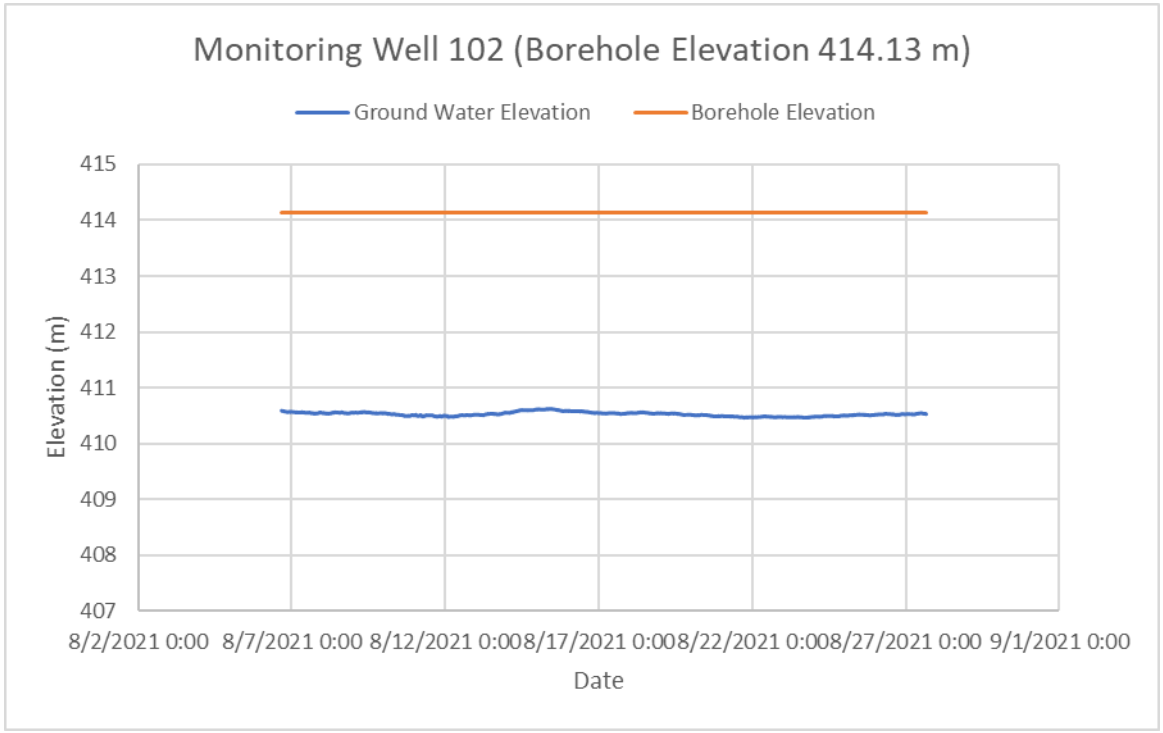
A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soils to be in areas noting to consist of stone-poor sandy silt to silty sand-textured till, ice-contact stratified deposits of sand and gravel, with minor silt and clay, as well as river deposits of coarse gravel. These conditions are consistent with the observations during drilling.

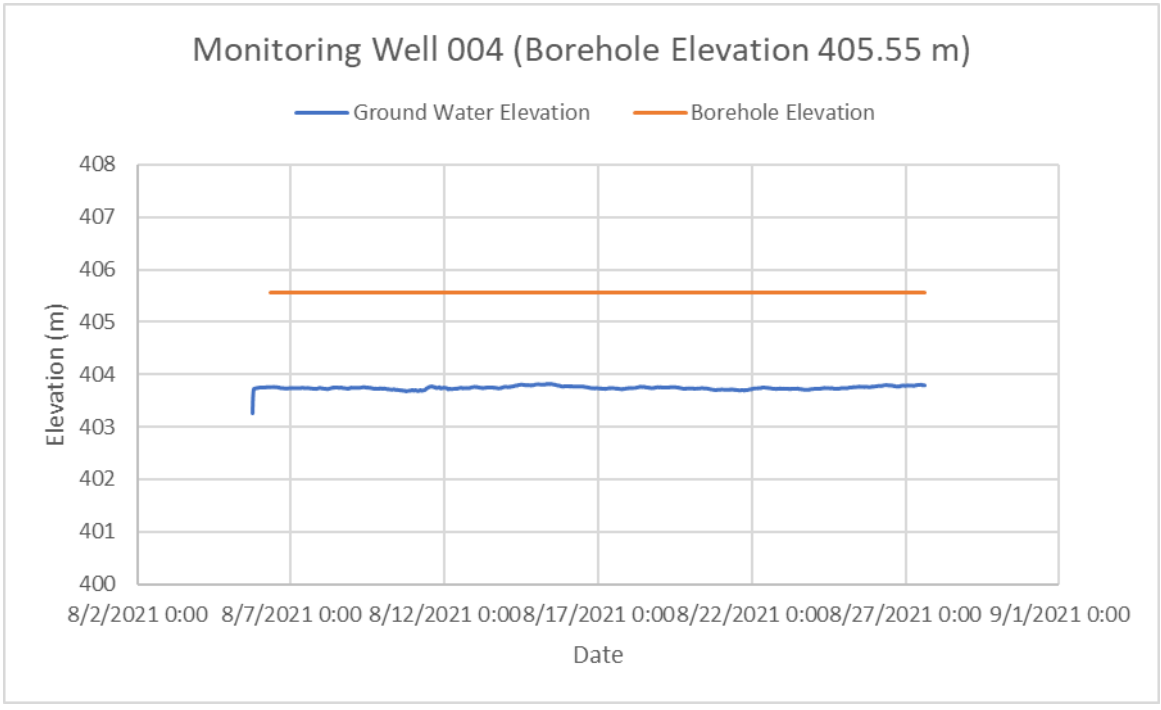
Groundwater Observations

Borehole Nos. 006, 102, and 004 were noted to have 'caved' to depths of between approximately 2.4 to 3.8 metres and 'wet' at depths of between approximately 2.0 to 3.4 metres, while Borehole No. 104 was noted to be open and 'wet' at a depth of 7.0 metres upon completion. Borehole Nos. 103 and 001 were noted to have cave to depths of 2.7 and 1.5 metres, respectively, and dry upon completion. The remainder of the boreholes were noted as being open and 'dry' [i.e. no free groundwater present] upon completion of drilling. It is noted that insufficient time would have passed for the static groundwater level to stabilise in the open boreholes.

As noted above, a monitoring well was installed at Borehole Nos. 101, 102, 104, and 004, to allow for future measurements of the static groundwater level. A data logger was installed in Borehole Nos. 101, 102, and 004 to allow for continuous monitoring of the groundwater level between August 6 and August 27, 2021, the readings of which have been illustrated in the following graphs:




Monitoring Well 102 (Borehole Elevation 414.13 m)
Ground Water Elevation
Borehole Elevation
Elevation (m)
415
414
413
412
411
410
409
408
407
8/2/2021 0:00
8/7/2021 0:00
8/12/2021 0:00
8/17/2021 0:00
8/22/2021 0:00
8/27/2021 0:00
9/1/2021 0:00
Date


Monitoring Well 004 (Borehole Elevation 405.55 m)
Ground Water Elevation
Borehole Elevation
Elevation (m)
408
407
406
405
404
403
402
401
400
8/2/2021 0:00
8/7/2021 0:00
8/12/2021 0:00
8/17/2021 0:00
8/22/2021 0:00
8/27/2021 0:00
9/1/2021 0:00
Date

In addition, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on August 6 and 27, 2021 and February 23, 2022. These have been summarized in the following chart:

TABLE B
SUMMARY OF GROUNDWATER LEVELS

	MW 101		MW 102		MW 104		MW 004	
Surface Elevation [m]	408.60		414.13		414.87		405.55	
	Depth	Elev.	Depth	Elev.	Depth	Elev.	Depth	Elev.
Aug 6, 2021	4.78	403.82	3.58	410.55	6.78	408.09	2.74	402.81
Aug 27, 2021	4.71	403.89	3.61	410.52	6.96	407.91	1.75	403.80
Feb 23, 2022	4.31	404.29	3.50	410.63	6.83	408.04	1.33	404.22

The groundwater level observed indicates a stabilized groundwater level on the order of approximately 2 to 7 metres below the existing grade, at an elevation of roughly 403.8 to 410.5 metres, varying with the physical topography. There is an evident drop in the groundwater level with a groundwater flow direction of NNE, generally following the topography towards the Irvine Creek Tributary. The approximate groundwater contours are illustrated in the attached Drawing No. 2.

Given the time of year of monitoring, the observed levels in August of 2021 would be considered reasonably representative of a seasonal ‘low’. The readings in February show seasonal fluctuation, but would not be considered representative of the seasonal ‘high’. However, the present data does provide an indication that the static groundwater level remains relatively steady over the year, with seasonal fluctuations on the order of perhaps 0.5 to 1.0 metre.

General Discussion of Subsurface Conditions

As noted above the subsurface conditions are generally characterized as sandy silt/clayey silt deposit in the upper levels, underlain by a permeably cohesionless sand deposit. The static groundwater level is within the permeable sand deposit, generally following the topography dropping to the north down to the Irvine Creek tributary. Representative geological cross sections are illustrated in Drawing Nos. 3, 4 and 5, attached.

4. PRELIMINARY HYDROGEOLOGICAL CONSIDERATIONS

As noted above, it is understood that the development is anticipated to consist of single family dwellings and townhouse blocks, including the installation of associated underground municipal services along asphalt paved roadways. Excavations for the proposed development services are expected to extend to depths of up to approximately to 2 to 5 metres below the existing ground surface, while excavations for foundations would be expected to extend up to approximately 2 metres. Measurements of the groundwater level at the monitoring well locations indicate a groundwater level on the order of approximately 2 to 7 metres below the existing ground surface, generally 3.5 to 7 metres over the Clayton lands presently proposed for development. The groundwater level is shallower to the east, approaching the Irvine Creek tributary, generally following the drop in topography toward the creek.

These conditions, with relatively permeable soil conditions at depth, and groundwater at sufficient depth, are well suited to proposed development. Site earthworks and servicing should be readily designed to avoid or limit encountering the natural groundwater level and thus minimise any potential interaction with the groundwater. The generally permeable condition of the native sand deposit present over the site will generally allow for natural drainage and movement of groundwater. As such, it is not considered likely that service trenches would present any conflict or impact to the natural groundwater conditions. The exception might be deeper trunk sewers, which would warrant closer assessment as the detailed design proceeds. As noted above, additional detailed hydrogeological assessment work is presently underway to help further inform the design and construction.

The short-term excavations for the proposed servicing are generally anticipated to extend into the sandy silt/clayey silt and sand soils to depths above the static groundwater level. Such excavations would be expected to be subject to relatively minor groundwater infiltration, such that it should be possibly to adequately control such infiltration using conventional construction dewatering techniques such as pumping from sumps in the base of the excavation. During wet times of year, some instability of the excavations may be experienced. The rate of dewatering would be expected to be below 50,000 L/day for most shallow excavations, and certainly below 400,000 L/day, such that an EASR or PTTW should not be required. Where deeper excavations are identified to be required, extending below the static groundwater level, [i.e. deeper sewer mains, pumping chambers, etc.] the need for temporary dewatering controls during construction should be more closely evaluated. Depending on the proposed depths of excavations for the proposed footings and site services, the rate of dewatering could be

greater than 50,000 L/day, potentially requiring an EASR. As such, once available, the site servicing and grading plans detailing depths of construction should be forwarded onto our office for further review and comments.

The final grading of the site should appropriately consider the groundwater levels in order to minimise or avoid conflict or impact to the groundwater during and post construction. In this regard the grading and storm water management plan should accommodate surface runoff that follows the existing overall drainage patterns as much as possible. This would suggest SWM pond as best located to the north of the site, adjacent to Woolwich Street and ideally as far east as possible.

It is also noted that the use of Low Impact Design [LID] methods as part of the stormwater management for the proposed development would be viable for much of the site and should be considered. The permeable sand deposit, above the groundwater level, would afford an opportunity for natural infiltration of surface runoff, such as in 'dry' ponds, infiltration galleries, etc. As noted above, the sand deposit would have hydraulic conductivity on the order of 10^{-2} to 10^{-3} cm/sec, correlating to design infiltration rates on the order of 100 to 300 mm/hr. The use of infiltration systems could be readily utilised for lot level infiltration of rain water from downspouts, and also within the overall SWM pond.

Based on our present observations and available information, it is not anticipated that the proposed development will have an adverse impact on the groundwater condition in the area. As noted, further detailed hydrogeological assessment is presently underway, and will be formally reported to support the detailed design processes. As the detailed design of the proposed development proceeds, this office should be consulted to review the hydrogeological conditions and assess the potential for concern.

5. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Scott Wylie, B.Eng., EIT.

Ian Shaw, P. Eng., QP_{ESA}
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Drawing No. 2, Groundwater Contour Map
Drawing Nos. 3, 4 and 5, Geological Cross-Sections
Log of Borehole Nos. 101 to 104, and 001 to 007 inclusive
Grain Size Analyses

Distribution: Cachet Developments [pdf]

LEGEND

- Borehole Location — BH#
- Monitoring Well Location — MW#
- Geological Cross Section Location

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301951-G.

2. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Sideroad 15 and 75 Woolwich Street East
Elora, Ontario

Borehole Location Plan

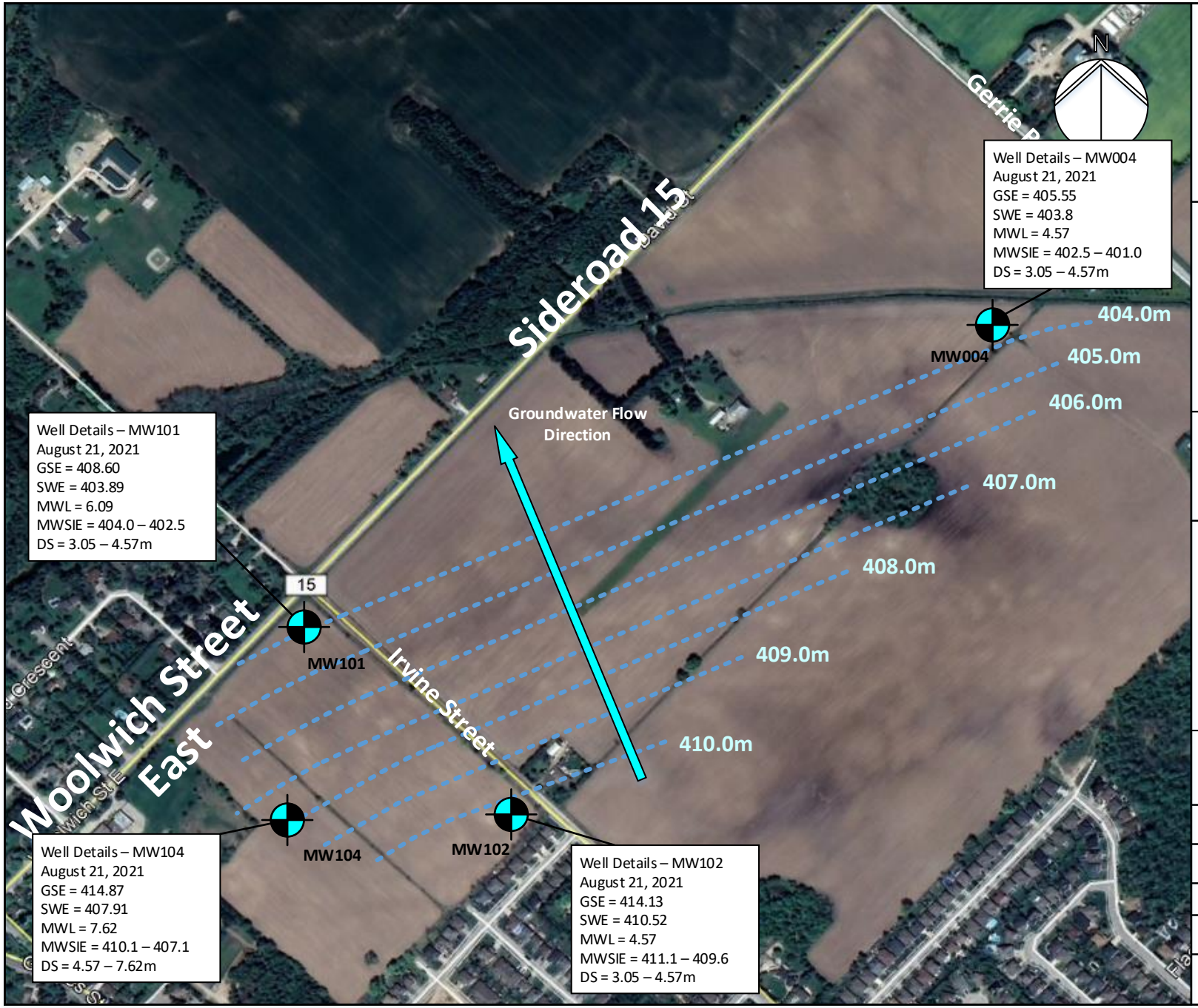
Project No. SM 301591-G

Date: February 2022

Drawn: SW	Checked: IS

SM 301591-G Borehole Location Plan

Drawing No. 1



LEGEND

Monitoring Well Location
MW#

GSE = Monitoring Well Ground Surface Elevation
SWE = Static Water Elevation [taken on Aug. 21, 2021]
MWL = Monitoring Well Length
MWSIE = Monitoring Well Screen Interval Elevation
DS = Depth of Screen

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301951-G.

2. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Sideroad 15 and 75 Woolwich Street East
Elora, Ontario

Groundwater Contour Map

Project No. SM 301591-G

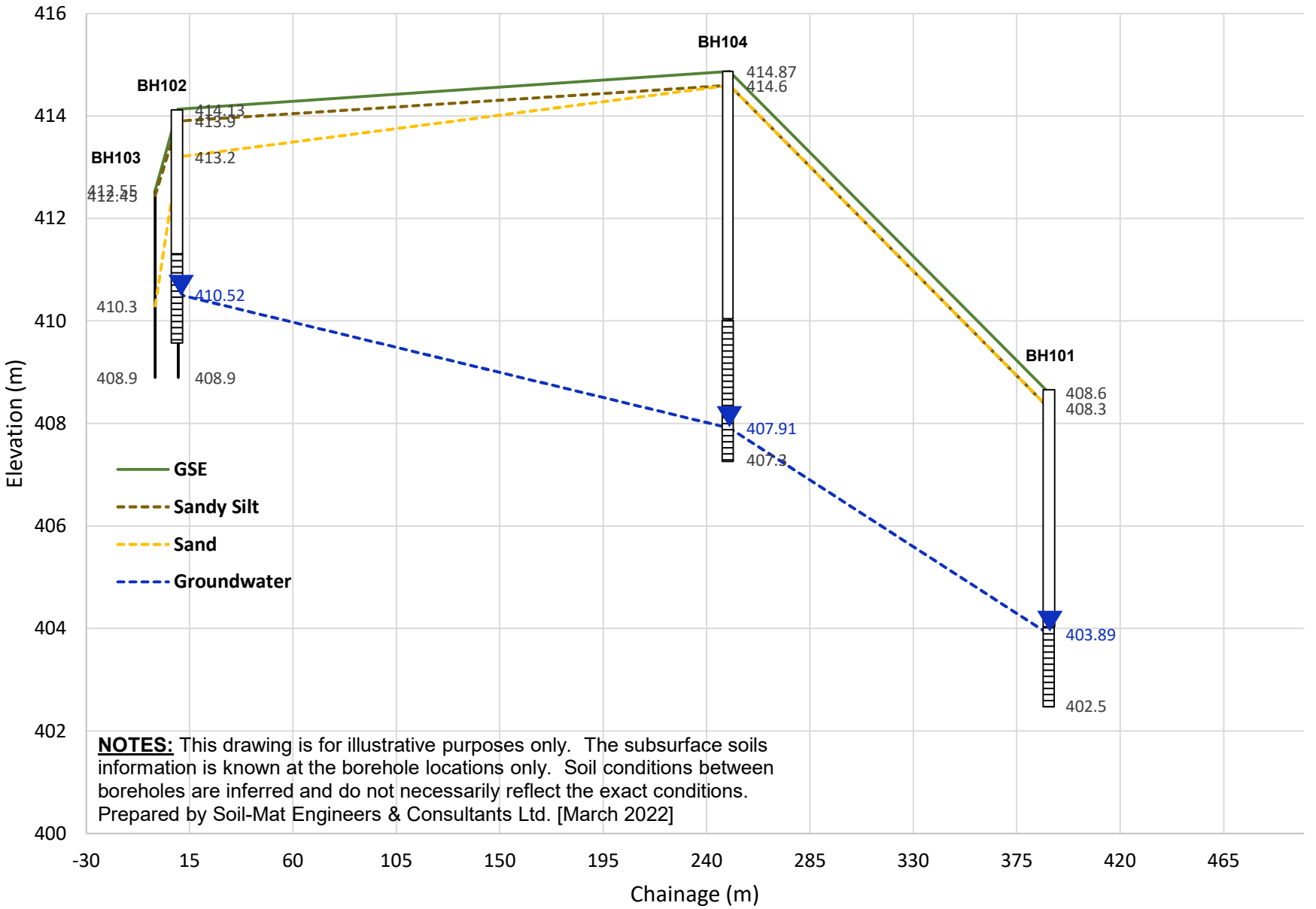
Date: February 2022

Drawn: SW | Checked: IS

SM 301591-G Groundwater Contour Map

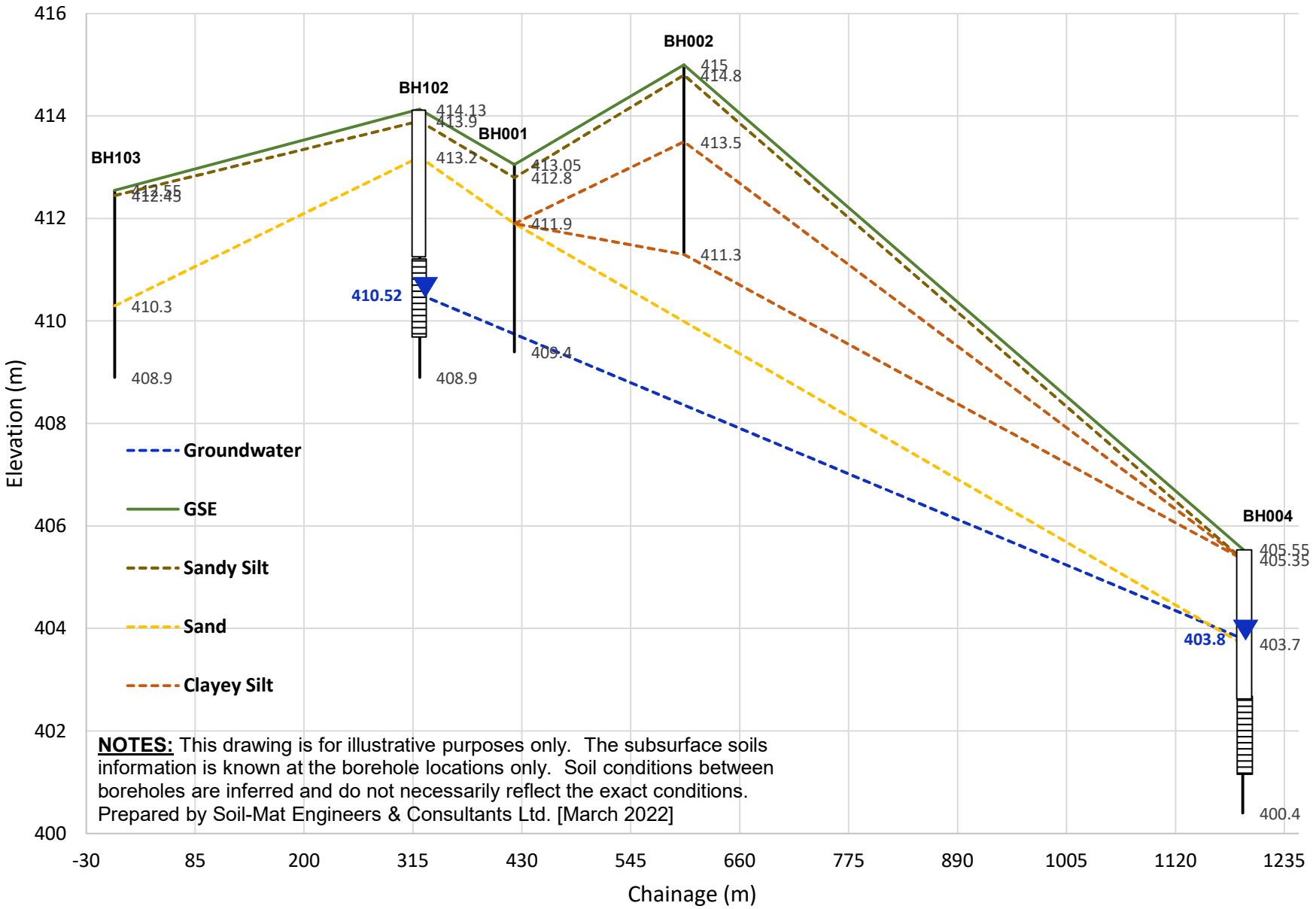
Drawing No. 2

Geological Cross Section A-A



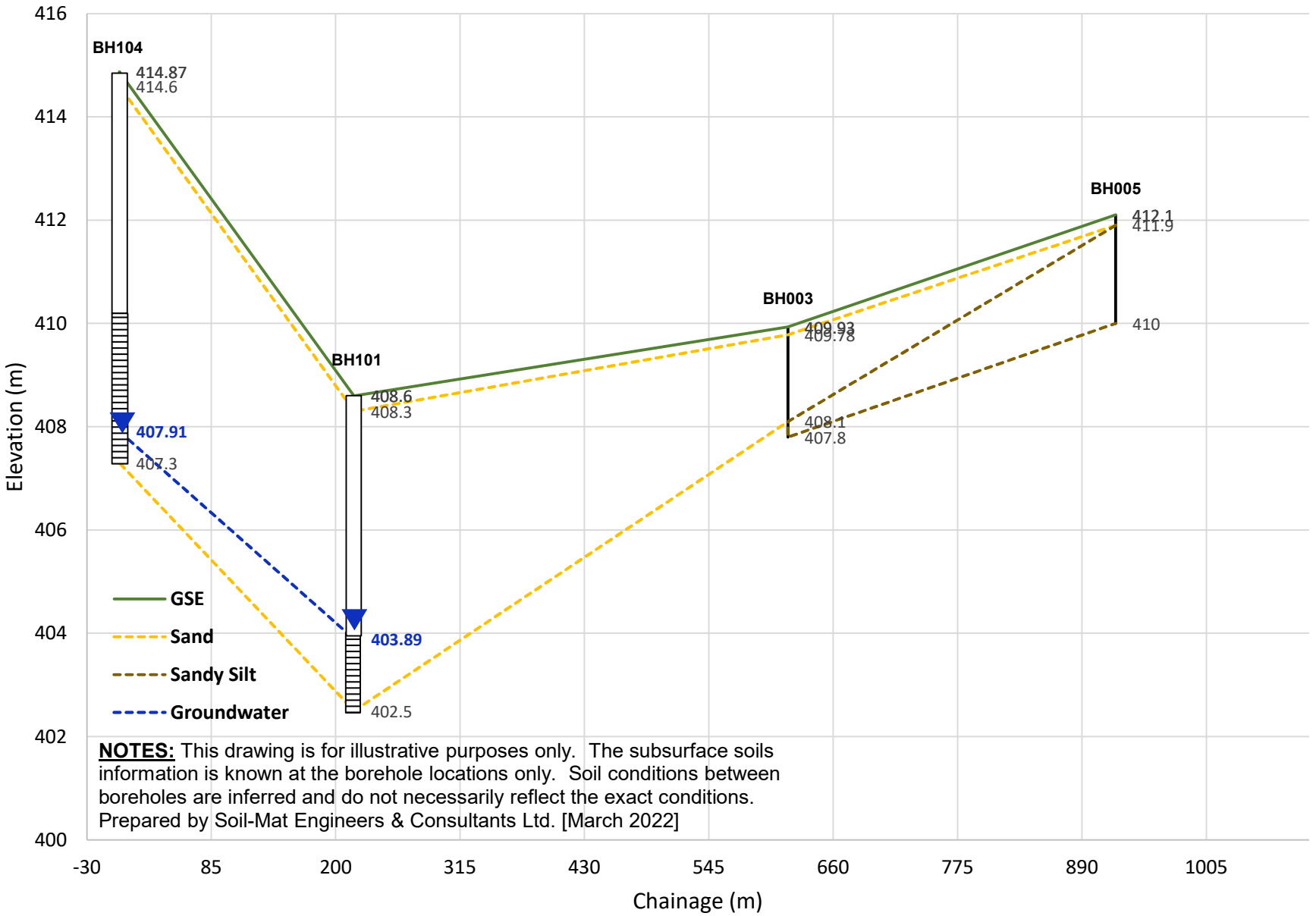
NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [March 2022]

Geological Cross Section B-B



NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [March 2022]

Geological Cross Section C-C

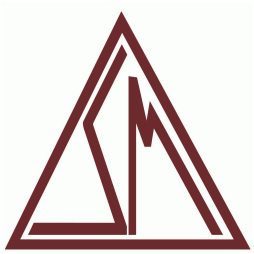


NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [March 2022]

Log of Borehole No. 101

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838437
E: 545149



Depth (ft)	Depth (m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	SAMPLE PP (kgf/cm2)	SAMPLE U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
		408.60	Ground Surface									
0	0	408.30	**Topsoil** Approximately 250 millimetres of topsoil.									
1			**Sand** Brown, trace gravel.									
2	1											
3												
4												
5	2											
6												
7												
8	3											
9												
10												
11												
12	4											
13												
14												
15												
16	5											
17												
18		403.10	Transition to grey in colour									
19												
20	6	402.50	End of Borehole									
21												
22												
23	7											
24												
25												
26	8											
27												
28												
29												
30	9											
31												
32												
33												

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 6.10 metres.
2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. No soil samples were retrieved. The following free groundwater level readings have been measured:

August 6, 2021 - 4.78 metres below ground surface.

August 27, 2021 - 4.71 metres below ground surface.

October 14, 2021 - 4.33 metres below ground surface.

February 23, 2021 - 4.31 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

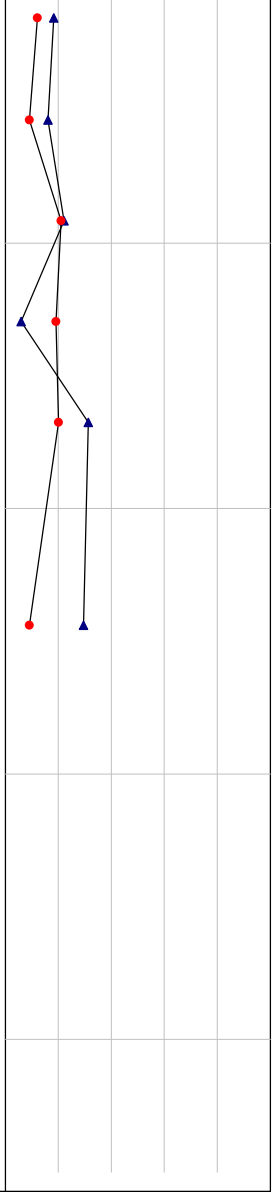
Log of Borehole No. 102

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838180
E: 545422

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	414.13	Ground Surface								
0 / 0	413.90	**Topsoil** 250 millimetres of topsoil.								
		Sandy Silt Brown, trace clay, trace gravel, reworked in upper levels, loose to compact.		SS	1	4 5 7 8	12			
3 / 1	413.20			SS	2	2 3 6 5	9			
		Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, loose to compact.		SS	3	3 9 12 14	21			
				SS	4	7 8 11 10	19			
				SS	5	6 9 11 17	20			
16 / 5	408.90			SS	6	7 5 4 9	9			
		End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as caved to a depth of 3.8 metres and 'wet' at a depth of 3.6 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 3.58 metres below ground surface.

August 27, 2021 - 3.61 metres below ground surface.

October 14, 2021 - 3.62 metres below ground surface.

February 23, 2021 - 3.5 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 103

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4837942
E: 545194

Depth (ft)	Depth (m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.55	Ground Surface								
0	0		**Topsoil** Approximately 100 millimetres of topsoil.		SS	1	5 5 7 8	12			
3	1		**Sandy Silt** Brown, trace to some gravel and clay, reworked in upper levels, compact.		AS	2	6 5 3 3	8			
6	2				SS	3	5 6 6 6	12			
		410.30									
9	3		**Sand** Brown, trace clay, silt, and gravel, medium gradation, loose.		SS	4	2 3 3 2	6			
11					SS	5	2 1 1 2	2			
		408.90									
12	4		End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded dry and caved to a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 104

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838174
E: 545084

Depth (ft)	Depth (m)	Elevation (m)	Description	Sample Type	Sample Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		414.87	Ground Surface							
0	0	414.60	**Topsoil** Approximately 250 millimetres of topsoil.							
1–5	0–1		**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, fine to medium gradation, compact.	SS	1	5 5 6 7	11			
				SS	2	8 9 9 7	18			
6–10	2–3			SS	3	2 5 8 7	13			
				SS	4	6 11 16 13	27			
				SS	5	10 12 11 13	23			
16–19	5–6	408.80	Wet spoon	SS	6	5 10 13 15	23			
20–23	6–7			SS	7	9 9 8 6	17			
24–31	7–9	407.30	End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 7.6 metres.

2. Borehole was recorded as open and 'wet' at depth of 7.0 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 6.78 metres below ground surface.

August 27, 2021 - 6.96 metres below ground surface.

October 14, 2021 - 7.09 metres below ground surface.

February 23, 2022 - 6.83 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 001

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838268
E: 545454

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		413.05		Ground Surface								
0	0	412.80		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	4 5 7 6	12			
3	1	411.90		**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, compact.		SS	2	6 7 6 6	13			
				Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, compact.		SS	3	5 8 12 14	20			
10	3					SS	4	12 10 13 10	23			
11		409.40				SS	5	6 11 13 15	24			
12	4			End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as dry and caved to a depth of 1.5 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 002

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838469
E: 545516

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	415.00		Ground Surface								
0 / 0	414.80		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	2 4 4 5	8			
1 / 1			**Sandy Silt** Brown, reworked in upper levels, trace clay, silt, and gravel, loose.		SS	2	4 3 6 8	9			
5 / 1	413.50		**Clayey Silt** Brown, trace to some sand and gravel, stiff to very stiff.		SS	3	6 6 6 7	12		3.5	
8 / 2	412.50		Transition to grey.		SS	4	3 7 6 7	13		4.0	
10 / 3					SS	5	9 7 15 18	22		>4.5	
12 / 3	411.30		End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.7 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 003

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838652
E: 545505

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		409.93	Ground Surface							
0	0		**Topsoil** Approximately 150 millimetres of topsoil.	SS	1	4 6 10 8	16			
3	1		**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, compact.	SS	2	6 10 10 7	20			
6	2	408.10 / 407.80	**Sandy Silt** Brown, trace to some gravel and clay, compact.	SS	3	6 8 10 11	18			
			End of Borehole							

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 2.1 metres.
2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 004

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838792
E: 546044

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		405.55		Ground Surface								
0	0	405.35		**Topsoil** Approximatelty 200 millimetres of topsoil.								
1				**Sandy Silt** Brown, trace to some clay, trace gravel, reworked in upper levels, loose.		SS	1	2 3 5 6	8			
2												
3	1					SS	2	4 3 3 5	6			
4												
5												
6		403.70		**Sand** Brown, trace clay, silt, and gravel, medium to coarse gradation, wet, compact to dense.		SS	3	8 10 12 15	22			
7	2											
8						SS	4	8 10 11 10	21			
9												
10	3					SS	5	8 10 23 30	33			
11												
12												
13	4											
14												
15		400.70										
16	5	400.40		Transition to grey.		SS	6	3 11 18 23	29			
17				End of Borehole								
18												
19												
20	6											
21												
22												
23	7											
24												
25												
26	8											
27												
28												
29	9											

Moisture Content w%
10 20 30 40

Standard Penetration Test blows/300mm
20 40 60 80

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 5, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as open and 'wet' at a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 2.74 metres below ground surface.

August 27, 2021 - 1.75 metres below ground surface.

February 23, 2021 - 1.33 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 5, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 005

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838939
E: 545636

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 / 0	412.10		Ground Surface									
0 / 0	411.90		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	2 4 5 7	9				
3 / 1			**Sandy Silt** Brown, reworked in upper levels, trace to some clay, increasing clay content with depth, occasional gravel, loose to compact.		SS	2	1 3 3 5	6				
6 / 2	410.00				SS	3	3 5 7 9	12				
7 / 2			End of Borehole									

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 2.1 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 006

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4839162
E: 545871

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	420.91		Ground Surface								
0 / 0	420.70		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	4 4 4 4	8			
3 / 1	419.40		**Sand** Brown, reworked in upper levels, trace rootlets, loose to compact.		SS	2	3 5 6 6	11			
6 / 2			**Sandy Silt** Brown, trace clay, increasing clay content with depth, loose to compact.		SS	3	5 6 6 7	12			
9 / 3					SS	4	3 4 4 4	8			
11 / 3	417.30				SS	5	5 11 10 15	21			
12 / 4			End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as wet at depth of 2.0 metres, and caved to a depth of 2.4 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 007

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838910
E: 546126

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	408.39	Ground Surface								
0 / 0	408.10	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	3 5 6 7	11			
3 / 1	406.90	**Sandy Silt** Brown, trace rootlets, trace clay, reworked in upper levels, increasing clay content with depth, compact.		SS	2	10 8 10 10	18			
6 / 2		**Clayey Silt** Brown, trace to some sand and gravel, stiff to hard.		SS	3	3 5 6 6	11		2.0	
9 / 3				SS	4	5 7 10 18	17		2.5	
11 / 3	404.70			SS	5	24 36 50/5"	100		>4.5	
12 / 4		End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.0 metres.

2. Borehole was recorded as open and dry upon completion and backfilled as per Ontario Regulation 903.

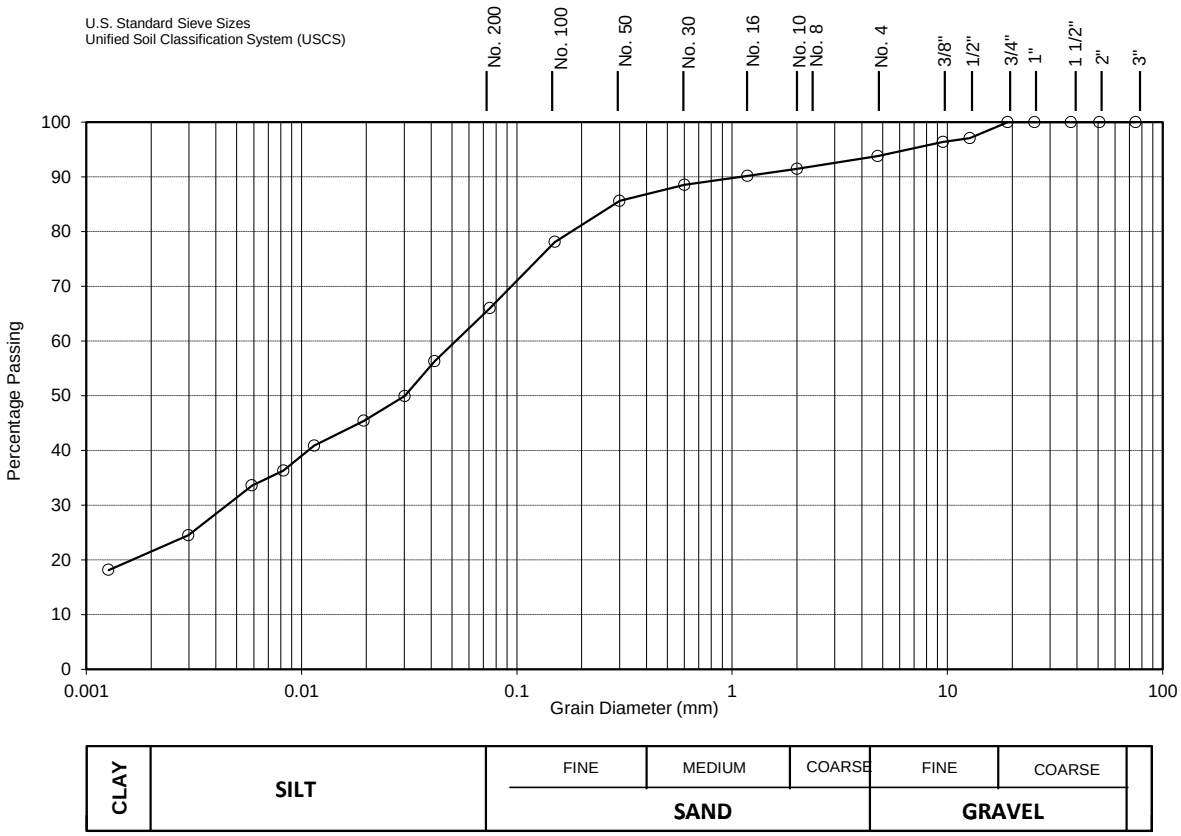
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Mechanical & Hydrometer Analyses



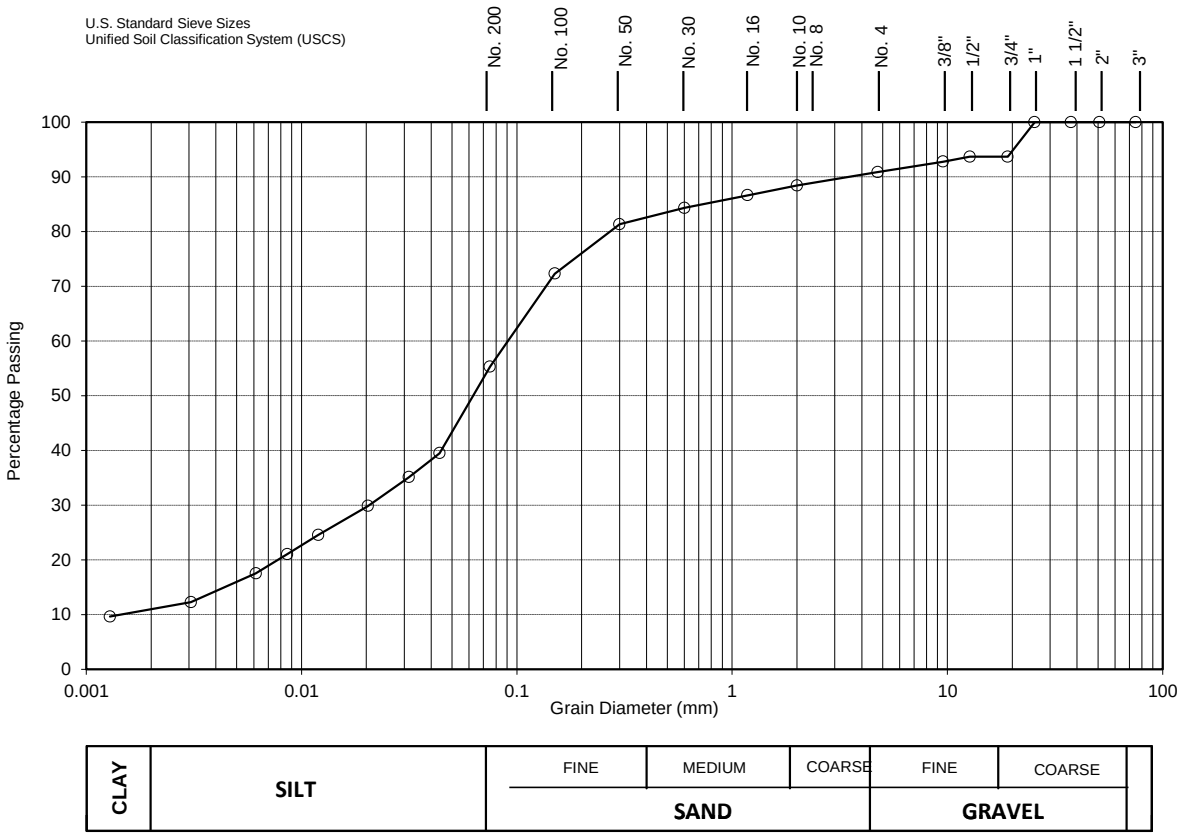
Lab No.:	**21-335**	Notes: Depth: 5'			
Sample No.:	**3**				
Borehole No.:	**2**				
CLAY [%]:	**22**	Soil Description:	**Brown Sandy Silt w/ some Clay and trace Gravel**		
SILT [%]:	**44**		**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**		
SAND [%]:	**28**				
GRAVEL [%]:	**6**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0005**	Coefficient of Uniformity C_U:	**102.0**	Coefficient of Curvature C_C:	**0.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 1**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



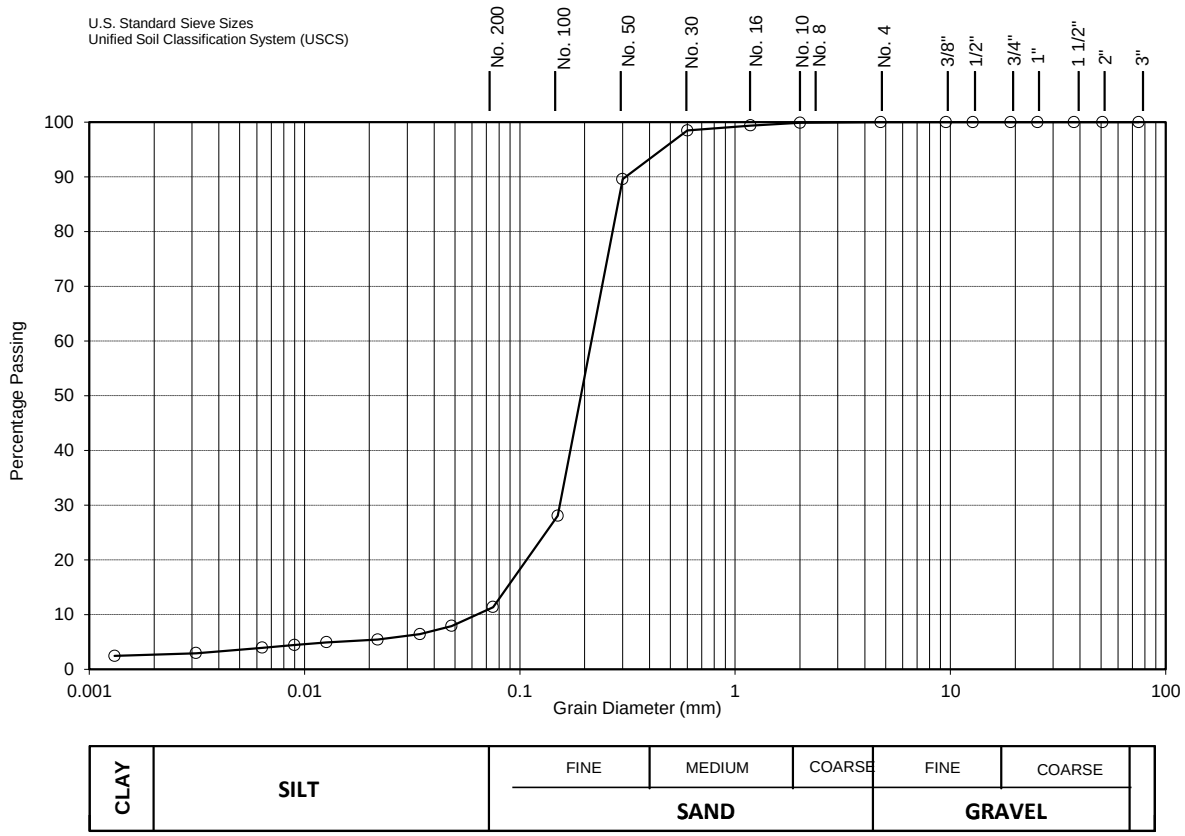
Lab No.:	**21-336**	Notes: Depth: 10'	
Sample No.:	**5**		
Borehole No.:	**4**		
CLAY [%]:	**11**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**44**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**36**		
GRAVEL [%]:	**9**	Estimated Infiltration Rate [mm/hr] : **10 to 15**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0015**	Coefficient of Uniformity C_U: **60.0**	Coefficient of Curvature C_C: **3.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 2**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



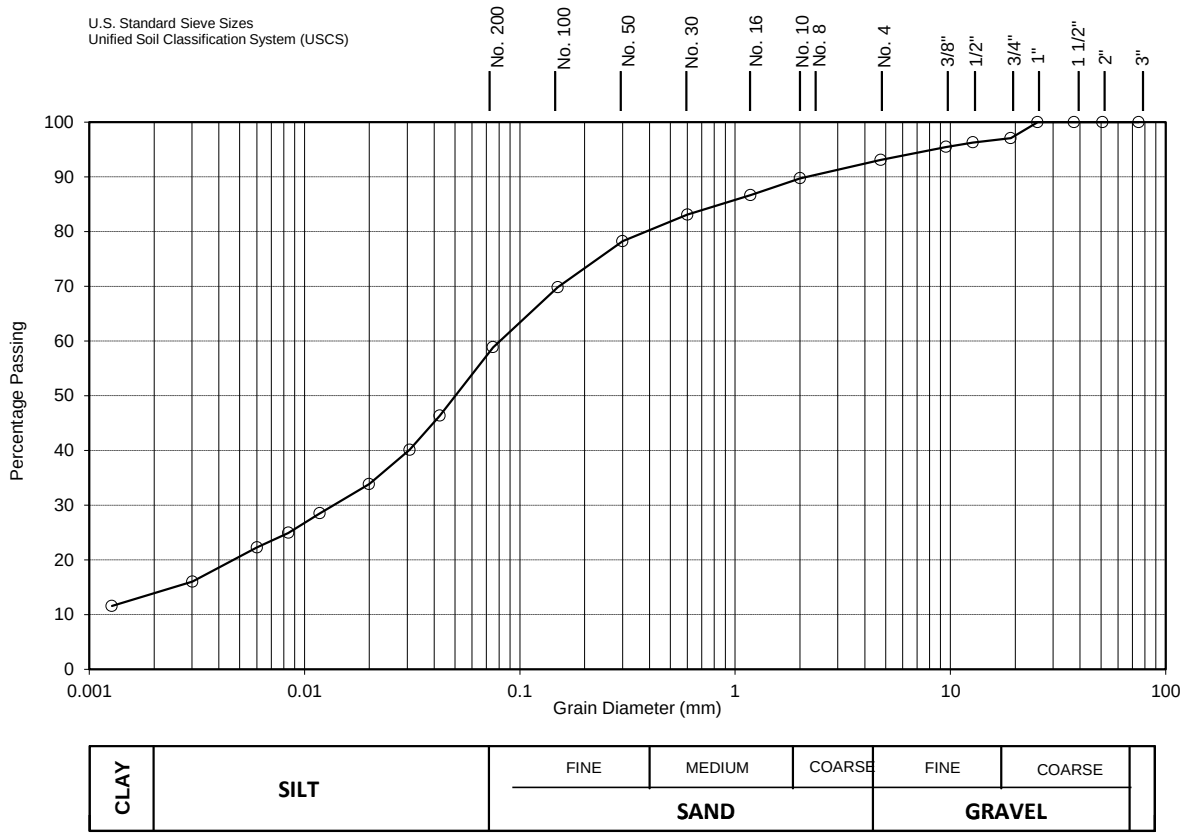
Lab No.:	**21-337**	Notes: Depth: 7.5'	
Sample No.:	**4**		
Borehole No.:	**5**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ traces of Silt and Clay**	
SILT [%]:	**9**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**89**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] : **100 to 150**	Estimated Permeability, k [cm/s] **10^{-3} to 10^{-2}**
D_{10} (Effective Diam. in mm):	**0.0600**	Coefficient of Uniformity C_U: **3.7**	Coefficient of Curvature C_C: **1.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 3**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



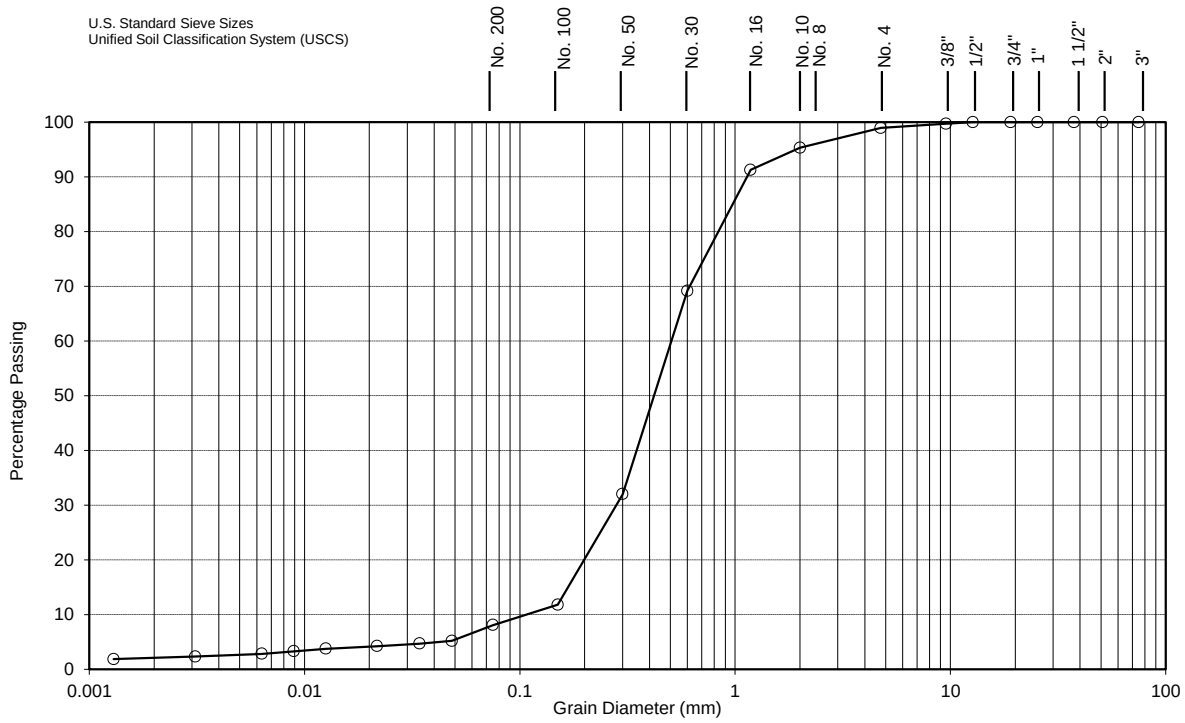
Lab No.:	**21-338**	Notes: Depth: 5'	
Sample No.:	**3**		
Borehole No.:	**7**		
CLAY [%]:	**14**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**45**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**34**		
GRAVEL [%]:	**7**	Estimated Infiltration Rate [mm/hr] : **< 10**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.00100**	Coefficient of Uniformity C_U: **80.0**	Coefficient of Curvature C_C: **2.1**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 4**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

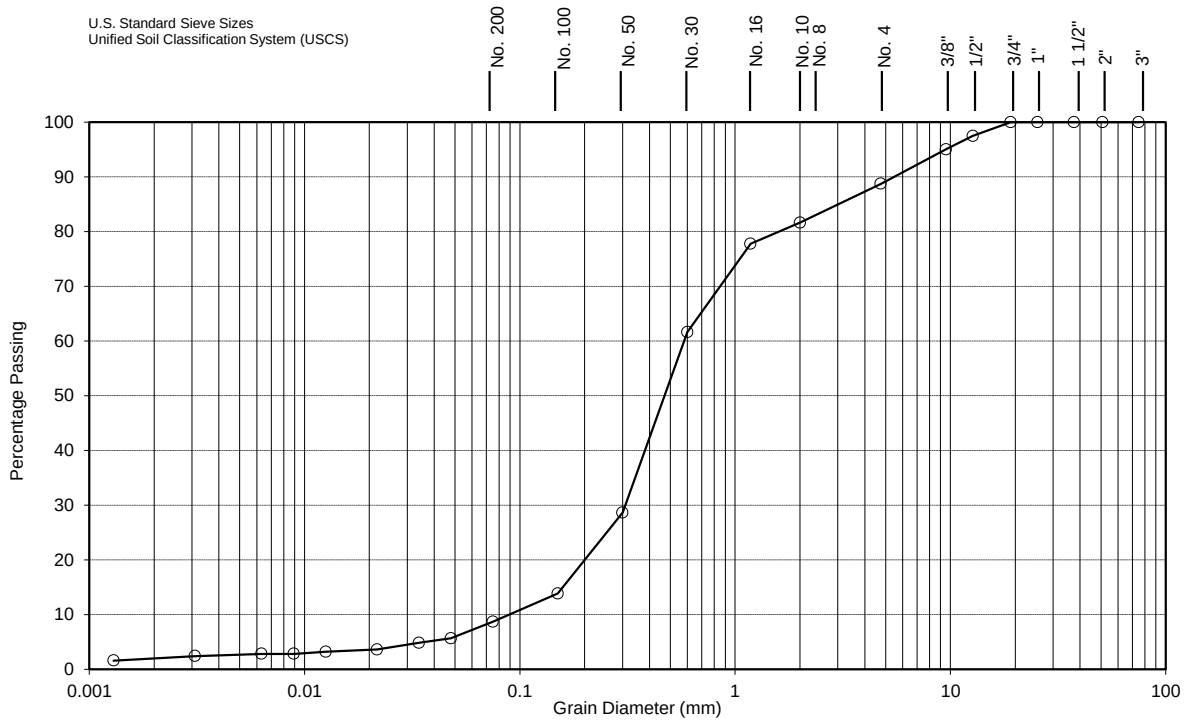
Lab No.:	**21-339**	Notes: Depth: 15'			
Sample No.:	**6**				
Borehole No.:	**8**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ traces of Silt, Clay and Gravel**		
SILT [%]:	**6**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**91**				
GRAVEL [%]:	**1**	Estimated Infiltration Rate [mm/hr] :	**150 to 300**	Estimated Permeability, k [cm/s]	**10^{-2}**
D_{10} (Effective Diam. in mm):	**0.10**	Coefficient of Uniformity C_U:	**5.1**	Coefficient of Curvature C_C:	**1.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 5**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**21-340**	Notes: Depth: 10'	
Sample No.:	**5**		
Borehole No.:	**10**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ some Gravel and traces of Silt and Clay**	
SILT [%]:	**7**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**80**		
GRAVEL [%]:	**11**	Estimated Infiltration Rate [mm/hr] : **150 to 300**	Estimated Permeability, k [cm/s] **10^{-2}**
D_{10} (Effective Diam. in mm):	**0.090**	Coefficient of Uniformity C_U: **6.6**	Coefficient of Curvature C_C: **1.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 6**	**Project No.: SM 301951-T**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

Hamilton: 130 Lancing Drive L8W 3A1 T: 905.318.7440 F: 905.318.7455
Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 800.243.1922

PROJECT NO.: SM 301951-G July 20, 2022

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Marcus Gagliardi
Development Planner

DRAFT HYDROGEOLOGICAL ASSESSMENT
PROPOSED RESIDENTIAL DEVELOPMENT
CLAYTON AND ELORA SANDS
ELORA, ONTARIO

Dear Mr. Gagliardi,

Further to your recent correspondence and discussions, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has prepared the following hydrogeological assessment based on the updated groundwater information to date. These comments are further to our Preliminary Geotechnical and Hydrogeological Investigation reports for the subject lands [SM 301951A-G and SM 301951B-G, dated October 14, 2021 and March 11, 2022], and recent discussions with the design team. As such, this hydrogeological report should be read in conjunction with our previous reports stated above. It is also noted that this report marks the completion of all of the proposed drilling fieldwork, and as such a new borehole numbering system has been implemented.

1. INTRODUCTION

We understand that the project will involve the construction of a residential development on the Clayton Lands located at 75 Woolwich Street East [Clayton Lands] in Elora, Ontario, along with potential future development on the Elora Sands [Elora Sands] to the east. The development details are to be established, but are anticipated to consist of single-family dwellings and townhouses along asphalt paved roadways, including the installation of associated underground municipal services. The purpose of this hydrogeological assessment is to provide additional and more detailed information and comments to support the assessment of site servicing options for the proposed development, from a geotechnical point of view.

2. PROCEDURE

Ten [10] and fifteen [15] sampled boreholes were advanced on the Clayton and Elora Sands respectively, totalling twenty-five [25] boreholes at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan. The boreholes were advanced using continuous flight power auger equipment between August 5, 2021 and April 18, 2022 under the direction and supervision of a staff member of SOIL-MAT ENGINEERS & CONSULTANTS LTD., to termination at depths of between approximately 2.1 and 8.2 metres below the existing ground surface.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on all soil samples recovered from the borings. Selected samples were also subjected to laboratory grain size analyses to allow for an estimate of the hydraulic conductivity of the subsurface soils. It is noted that slug testing will be performed on a number of the monitoring wells to get a more accurate in-situ measurement of the hydraulic conductivity, results of which will be summarised in a subsequent supplemental report.

Upon completion of drilling, groundwater monitoring wells were installed at Borehole Nos. 004, 101, 102, 104, 201, 201A, 202, 203, 204, 205, 206, 301 through 305, and 401 to allow for the future monitoring of the groundwater level. The monitoring well consisted of 50-millimetre PVC pipe screened in the lower 1.5 to 3.0 metres. The monitoring wells were encased in well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite ‘hole plug’ to the surface and fitted with a protective steel ‘stick up’ casing. The remaining boreholes were backfilled in general accordance with Ontario Regulation 903, and the ground surface was reinstated even with the surrounding grade. The depths screening intervals for each monitoring well has been summarized below.

Monitoring Well ID	Depth (m)	Screening Interval (m)
MW004	4.6	3.0 – 4.6
MW101	6.1	4.6 – 6.1
MW102	4.6	3.8 – 4.6
MW104	7.6	4.6 – 7.6
MW201	4.6	3.8 – 4.6
MW201A	3.0	2.2 – 3.0
MW202	6.1	4.6 – 6.1

Monitoring Well ID	Depth (m)	Screening Interval (m)
MW203	6.1	4.6 – 6.1
MW204	4.6	3.0 – 4.6
MW205	4.6	3.0 – 4.6
MW206	7.6	6.1 – 7.6
MW301	7.6	6.1 – 7.6
MW302	7.6	6.1 – 7.6
MW303	7.6	6.1 – 7.6
MW304	6.1	4.6 – 6.1
MW305	3.0	2.3 – 3.0
MW401	6.1	4.6 – 6.1

The boreholes were located in the field by representatives of SOIL-MAT ENGINEERS, based on accessibility over the site, clearance of underground utilities, and the drawing that was forwarded to our office. Best efforts were made to minimize crop damage by locating the majority of the boreholes to the perimeter of the fields. The ground surface elevation at all of the borehole locations with the exception of Borehole Nos. 301 through 307 have been referenced to a geodetic benchmark, described as North American 1983 CSRS, as per the survey plan completed by POI Aerial, dated August 10, 2021, which was provided to our office. The ground surface elevations at Borehole Nos. 301 through 307 have been linearly interpolated based on the topographic survey provided by BSR&D (Reference No. 21-14-573-00-topo) dated January 4, 2022 which was provided to our office. Once a complete topographic survey has been completed with up-to-date geodetic elevations of Borehole Nos. 301 through 307, this report will be updated.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 001 to 007, 101 to 104, 201 to 206, 301 to 307, and 401, inclusive, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed at the exact depths of geological change.

2. SUBSURFACE CONDITIONS

The subsurface are presented in detail in our referenced Preliminary Geotechnical Investigation report. To summarize, the soil conditions encountered on the Elora Sands generally consisted of a sandy silt/silty sand deposit in the upper levels with some areas and layers of clayey sandy silt till with depth. The soils encountered on the perimeter of the site were highly variable, often encountering layered deposits of clayey sandy silt till

or sand. Occasional deposits of gravelly sand were encountered within some of the boreholes. As such, the presence of permeable granular deposits or 'veins' should be expected across the site. In areas where the presence of a predominately clayey material is expected or would be beneficial, such as in the area of the proposed SWM pond, it may be prudent to advance a series of test excavations to confirm the condition of the subsurface soils including composition, groundwater conditions, suitability for use as an impermeable SWM pond liner, etc.

The Clayton Lands was generally characterised by an upper layer consisting of a clayey sandy silt till underlain by a sand deposit that extended to deep depths. Some isolated areas were encountered that contained a more impermeable clayey sandy silt till. Representative geological cross sections are illustrated in Drawing Nos. 3, 4 and 5, attached.

A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soils to be in areas noting to consist of stone-poor sandy silt to silty sand-textured till, ice-contact stratified deposits of sand and gravel, with minor silt and clay, as well as river deposits of coarse gravel. These conditions are consistent with the observations during drilling.

Grain size analyses were conducted on sixteen [16] selected samples of the native soils recovered from the boreholes. The results of this grain size testing can be found appended to the end of this report, and are summarized as follows:

TABLE A
GRAIN SIZE ANALYSES

Elora Sands							
Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH003 SS3	1.5 m	22	44	28	6	10^{-7}	<10
BH004 SS5	3.0 m	2	7	80	11	10^{-2}	150 to 300
BH006 SS5	3.0 m	11	44	36	9	10^{-6}	10 to 15
BH201 SS2	1.5 m	5	17	76	2	10^{-4}	50
BH202 SS2	1.5 m	30	38	26	0	10^{-8}	<10
BH202 SS5	6.1 m	10	51	39	0	10^{-6}	10 to 15
BH203 SS2	1.5 m	3	17	37	43	10^{-4}	50 to 60
BH203 SS5	6.1 m	3	8	87	2	10^{-3}	125 to 150
BH204 SS2	1.5 m	16	34	30	20	10^{-7}	10
BH205 SS3	3.0 m	2	4	94	0	10^{-3}	150 to 300

Clayton Lands							
Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH102 SS6	4.6 m	2	6	91	1	10^{-2}	150 to 300
BH103 SS3	1.5 m	14	45	34	7	10^{-6}	10
BH104 SS4	2.3 m	2	9	89	0	10^{-3} to 10^{-2}	100 to 150
BH302 SS2	1.5 m	2	3	95	0	10^{-2}	150 to 300
BH304 SS2	1.5 m	16	40	33	11	10^{-7}	10
BH305 SS2	1.5 m	7	16	77	0	10^{-4}	50 to 60

The field and laboratory testing demonstrate the native soils to generally consist of a sandy silt/clayey silt with some clay and traces of gravel in the upper levels, transitioning to a highly permeable sand with traces of clay, silt, and gravel at depth. According to the Unified Soil Classification System (USCS), the soils are classified as M.L. – inorganic silts and very fine sands, clayey silts with slight plasticity in the upper levels overlying S.P. – poorly graded sands, with little to no fines to S.M. – Sand-silt mixtures at depth.

The clay and silt soils would generally behave as a cohesive material with slight to medium plasticity, and low hydraulic conductivity, on the order of 10^{-6} to 10^{-7} cm/sec, and would be of low permeability to effectively impermeable. The on-site clayey soils would generally be considered suitable for use as an impermeable clay liner for the stormwater management (SWM) pond, however should be confirmed with more specific testing and assessment, and would require selecting sorting to separate out from more sandy deposits. Further testing should be conducted within the area of the proposed stormwater management pond [SWM] in order to confirm the suitability of the clayey material for use as an impermeable liner.

The sand deposit would tend to yield a highly permeable characteristic. Provided that the low impact development (LID) stormwater management systems are located within the highly permeable sand deposits, the hydraulic conductivity for this material would be on the order of 10^{-2} to 10^{-4} cm/sec yielding infiltrations rates in the range of 50 to 300 mm/hr. LID systems such as rear yard catch basins, infiltration swales, etc. will be highly effective within the permeable sand soils and will be able to help with natural groundwater recharge as well as maintain pre and post development runoff volumes, specifically on the Clayton Lands. As noted previously, slug testing is slated to be performed within a number of the monitoring wells across the site to yield a more accurate estimate of the hydraulic conductivity of the native soils. Once available,

information on the location of these LID systems should be forwarded to our office in order to target specific areas with the slug testing.

Groundwater Observations

Borehole Nos. 006, 102, and 004 were noted to have 'caved' to depths of between approximately 2.4 to 3.8 metres and 'wet' at depths of between approximately 2.0 to 3.4 metres, while Borehole No. 104 was noted to be open and 'wet' at a depth of 7.0 metres upon completion. Borehole Nos. 103 and 001 were noted to have cave to depths of 2.7 and 1.5 metres, respectively, and dry upon completion. The remainder of the boreholes were noted as being open and 'dry' [i.e. no free groundwater present] upon completion of drilling. It is noted that insufficient time would have passed for the static groundwater level to stabilise in the open boreholes.

As noted above, monitoring wells were installed at Borehole Nos. 004, 101, 102, 104, 201, 201A, 202, 203, 204, 205, 206, 301 through 305, and 401, to allow for future measurements of the static groundwater level. A data logger was in each of the monitoring wells to allow for continuous monitoring of the groundwater level between August 2021 to June 2022, the readings of which have been illustrated in graphs which can be found appended to the end of this report.

In addition, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on various dates, ranging from August 2021 to June 2022. These have been summarized in the following charts:

TABLE B
SUMMARY OF MANUAL GROUNDWATER READINGS (ELORA SANDS)

Borehole No. 004 (Ground Surface Elevation of 405.55 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	2.74	402.8
August 27, 2021	1.75	403.8
February 23, 2022	1.33	404.2
April 22, 2022	1.47	404.1
June 1, 2022	1.78	403.8

Borehole No. 201 (Ground Surface Elevation of 404.80 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.69	402.1
April 22, 2022	1.88	402.9
June 1, 2022	2.44	402.4

Borehole No. 201A (Ground Surface Elevation of 404.75 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.8
April 22, 2022	2.05	402.7
June 1, 2022	2.43	402.3

Borehole No. 202 (Ground Surface Elevation of 406.59 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	5.5	401.1
April 22, 2022	4.76	401.8
June 1, 2022	5.43	401.2

Borehole No. 203 (Ground Surface Elevation of 407.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.0
April 22, 2022	5.90	401.2
June 1, 2022	5.91	401.2

Borehole No. 204 (Ground Surface Elevation of 409.56 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.81	406.7
April 22, 2022	1.16	408.4
June 1, 2022	1.53	408.0

Borehole No. 205 (Ground Surface Elevation of 412.99 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.56	410.4
April 22, 2022	2.25	410.7
June 1, 2022	2.39	410.6

Borehole No. 206 (Ground Surface Elevation of 412.88 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	6.83	406.1
April 22, 2022	4.60	408.3
June 1, 2022	4.66	408.2

Borehole No. 401 (Ground Surface Elevation of 420.91 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
April 22, 2022	2.29	418.6
June 1, 2022	2.39	418.5

TABLE C
SUMMARY OF MANUAL GROUNDWATER READINGS (CLAYTON LANDS)

Borehole No. 101 (Ground Surface Elevation of 408.60 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	4.78	403.8
August 27, 2021	4.71	403.9
October 14, 2021	4.33	404.3
February 23, 2022	4.31	404.3
April 22, 2022	4.07	404.5
June 1, 2022	4.15	404.5

Borehole No. 102 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	3.58	410.6
August 27, 2021	3.61	410.5
October 14, 2021	3.62	410.5
February 23, 2022	3.50	410.6
April 22, 2022	2.89	411.2
June 1, 2022	3.05	411.1

Borehole No. 103 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	6.78	408.1
August 27, 2021	6.96	407.9
October 14, 2021	7.09	407.8
February 23, 2022	6.83	408.0
April 22, 2022	6.13	408.7
June 1, 2022	6.28	408.6

Borehole No. 301 (Ground Surface Elevation of 412.75 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.29	406.5
April 22, 2022	5.65	407.1
June 1, 2022	5.71	407.0

Borehole No. 302 (Ground Surface Elevation of 413.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.62	406.4
April 22, 2022	6.06	406.9
June 1, 2022	6.12	406.9

Borehole No. 303 (Ground Surface Elevation of 414.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	5.40	408.6
April 22, 2022	6.04	407.9
June 1, 2022	6.11	407.9

Borehole No. 304 (Ground Surface Elevation of 407.90 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	2.87	405.0
April 22, 2022	2.60	405.3
June 1, 2022	2.96	404.9

Borehole No. 305 (Ground Surface Elevation of 408.60 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	Dry	<405.6
April 22, 2022	Dry	<405.6
June 1, 2022	Dry	<405.6

*Ground surface elevations have been interpolated based on contours from current topographic survey

The available data to date presented above illustrates a variable groundwater level, ranging from about 3 to 6 metres (elevations of between 407 to 411 metres) below the existing ground surface at Borehole Nos. 102, 104, 301, 302, and 303, at the southern half of the Clayton Lands, with the highest groundwater levels during the wet spring months. The groundwater drops to the southwest and to the north, as illustrated on Drawing No. 2, Groundwater Contour Map. The groundwater level drops to ranges of between 3 to 4 metres (elevations of between 404.5 to 405.3 metres) below the existing ground surface at the northern limits of the Clayton Lands. Based on the visual data displayed within the groundwater graphs, the data indicates a relatively stable groundwater level with small fluctuations between the 'wet' and 'dry' months of the year. This can be attributed to highly permeable fine to coarse grained sand and silty sand deposits within the southern half of the Clayton lands. The groundwater level within Borehole No. 304 was noted to be higher in comparison to the other wells, however may be more susceptible to precipitation, resulting in 'perched deposits' of water within the

more permeable above the clayey soils. The groundwater was noted to be deepest on the southern portion of the Clayton Lands, where the soil conditions at the borehole conditions generally indicated more permeable sandy soils until termination. The groundwater was shallowest at the northern portion of the Clayton lands, generally following the physical topography. Where encountered within the boreholes, the clayey deposits would tend to 'trap' the water within the low permeable layer and present a high groundwater condition than would otherwise be found within areas of permeable sandy soils. The manual readings gathered in April 2022 would be considered representative of a seasonal 'high'

The groundwater data gathered on the Elora Sands to date indicate a groundwater level on the order of 1.2 to 4.6 metres (elevations of between 408.5 to 410.7 metres) below the existing ground surface at Borehole Nos. 204, 205, and 206, predominantly located south of the landing strip within the farmer's field. The groundwater drops to the east towards a tributary of the Irvine Creek [also identified as Nichol Drain] with a groundwater elevation of between 402.8 to 404.2 metres measured manually periodically within Borehole No. 004 from August 2021 to June 2022. The groundwater level drops to the north as well towards Nichol Road 15 and where the storm water management pond is proposed. The groundwater level at this location is noted to be stabilizing at an elevation of between roughly 401 to 403 metres. The magnitude of fluctuations demonstrated within these areas are on the order of approximately 2 metres, according to the groundwater data graphs and may be attributed to the soil conditions, which is noted to be more layered.

It is also noted that the groundwater levels and elevations would tend to vary with the elevation changes across the site, which varies significantly. As such, it would be prudent to advance a series of test pits or additional boreholes across the site, specifically in the areas of notably higher groundwater levels and areas of large excavations for deeper services or pumping stations, in order to assess first hand how the groundwater will affect the excavations during site earthworks and servicing.

The direction of groundwater flow has been inferred from these groundwater levels, and has been illustrated on the groundwater contour map Drawing No. 2, Groundwater Contour Map. The direction of groundwater is locally flowing towards the Irvine Creek to the north and west on the Clayton Lands. The groundwater is flowing towards the tributary of the Irvine Creek [Nichol Drain] on the east side of the Elora Sands and to the north towards the Irvine Creek on the west side of the site. As such, the shallow groundwater is contributing to the base flow to the Nichol Drain. Best efforts should be exercised to maintain the overall natural drainage as part of the site grading, stormwater management plan and water balance across the site.

The subsurface soil and groundwater conditions described above are illustrated in the attached geological cross sections, Drawing Nos. 3, 4 and 5.

3. HYDROGEOLOGICAL SETTING AND WATER WELL STUDY

A review of available information, including water well records within an approximate 250 metre radius, was undertaken to inform the hydrogeological setting of the subject lands.

3.1.1 METHODS

Information was compiled for this hydrogeological assessment from sources including:

- Topographic, Bedrock Geology, and Soils maps.
- Ministry of Environment, Conservation and Parks [MOE] Water Well Records.
- Site visit of the property and review of adjacent lands.
- Site specific geotechnical investigation program involving a series of boreholes.

3.1.2 LIMITATIONS AND CONDITIONS

Information for this study was compiled from geological maps and well records for water wells drilled in the study area. Water well locations are approximated in well records using the UTM coordinate system and in some instances may be in error by more than 50 metres. Potential for mapping error therefore exists in correlation of well registration numbers with street addresses. Soils and bedrock descriptions in the well records are limited and generalized regarding formation lithology. Stratigraphic interpretation in this report is based on information from water well records, topographic maps, Paleozoic Geology maps of the area, and geotechnical investigations performed by SOIL-MAT ENGINEERS in the area.

3.2.1 GEOLOGY – OVERBURDEN SOIL

Local soils identified in the Ministry of Northern Development and Mine's "Quaternary Geology of Ontario, Southern Sheet Map M2556" are described predominantly as a silt to sandy silt 'till'. This is consistent with our geotechnical investigation, which found the overburden soils to consist primarily of sandy silt with some areas of sand with trace silt. Grain size analyses of representative soil samples yielded clay content in the range of 2 to 22 percent, silt content of 6 to 45 percent, sand content of 28 to 91 percent, and gravel content of 0 to 11 percent.

3.2.2 GEOLOGY – BEDROCK

Bedrock in the in the vicinity of the Site is recorded from the Ministry of Northern Development and Mine's "Bedrock Geology of Ontario, Southern Sheet Map M2344," as Limestone and Dolostone of the Guelph Formation. The depth to bedrock, as reported

in MOE water well records for wells in the proximity of the Site, is on the order of approximately 0.3 to 22.6 metres below ground surface.

3.2.3 GROUNDWATER CONDITIONS

The referenced geotechnical investigation for the site provides an estimate of the static groundwater level at approximately 2 to 7 metres below the existing grade. This is consistent with our experience on other nearby development projects. It is noted that the groundwater conditions within the overburden soils would be influenced by prevailing weather conditions and would experience seasonal fluctuation.

3.2.4 WATER WELL INVENTORY

MOE water well records revealed forty-four [44] wells located within an approximate 250 metre radius of the limits of the Site. The location of these available well records is illustrated in the attached Drawing No. 3. The water well records [https://www.ontario.ca/environment-and-energy/map-well-records] locations are approximated in well records using the UTM co-ordinate system and in some instances may be in error by more than 50 metres. Potential for mapping error therefore exists in correlation of well registration numbers with street addresses. Soils and bedrock descriptions in the well records are limited and generalized regarding formation lithology.

It is understood that the existing residential properties to the west and north are privately serviced with water wells or cisterns and septic systems, with the existing residential properties to the south and east are serviced with municipal water, storm and sanitary sewers.

The data contained in the water well records suggests that there are two [2] predominant aquifers in the Study Area, one which is considered a confined aquifer within the limestone bedrock at an estimated depth between 17.7 to 79.0 m bgs, with an average static water level of 11.3m. The other is an unconfined aquifer within the sandy silt, situated at an estimated depth between 2 and 7 m bgs. Data contained in MOE Water Well Records for forty-four [44] water wells within the *Study Area* are presented for statistical observations in Table A below.

The information gathered from the records indicates the following:

- Ground water was encountered as shallow as 17.7 metres below ground surface [“m bgs”] and as deep as 79.0 m bgs, with an average depth of 52.5 m bgs during the well drilling.
- Static water levels varied from 0.3 to 41.2 m bgs, with an average static level of 11.3 m bgs, and;
- The Pressure Head varied from 13.4 to 71.0 metres with an average of 41.2 metres.
- Recommended available pumping rates ranging between 3.5 and 25 gpm.
- The water bearing formation lithology reported in the majority of the wells was within the limestone bedrock.

Table 1: Water Well Records – Statistical Observations

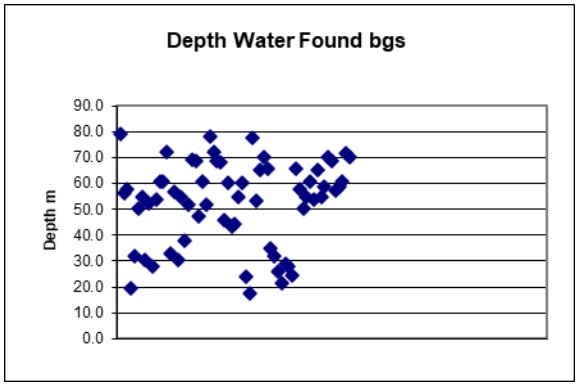
Part Lots 15-17 **Total wells =**
Concessions 8-10 **44**

Surface Elevation		Depth found bgs		Elevation found		Static depth bgs		Static Elevation		Pressure Head
fasl	masl	fasl	masl	fasl	masl	ft	m	fasl	masl	m
1380	420.7	*259*	79.0	*1121*	341.8	*26*	7.9	*1354*	412.8	71.0
1380	420.7	*184*	56.1	*1196*	364.6	*65*	19.8	*1315*	400.9	36.3
1358	414.0	*189*	57.6	*1169*	356.4	*20*	6.1	*1338*	407.9	51.5
1355	413.1	*64*	19.5	*1291*	393.6	*5*	1.5	*1350*	411.6	18.0
1350	411.6	*104*	31.7	*1246*	379.9	*23*	7.0	*1327*	404.6	24.7
1320	402.4	*165*	50.3	*1155*	352.1	*57*	17.4	*1263*	385.1	32.9
1300	396.3	*180*	54.9	*1120*	341.5	*47*	14.3	*1253*	382.0	40.5
1300	396.3	*100*	30.5	*1200*	365.9	*30*	9.1	*1270*	387.2	21.3
1300	396.3	*172*	52.4	*1128*	343.9	*53*	16.2	*1247*	380.2	36.3
1298	395.7	*91*	27.7	*1207*	368.0	*30*	9.1	*1268*	386.6	18.6
1305	397.9	*176*	53.7	*1129*	344.2	*30*	9.1	*1275*	388.7	44.5
1314	400.6	*200*	61.0	*1114*	339.6	*35*	10.7	*1279*	389.9	50.3
1314	400.6	*200*	61.0	*1114*	339.6	*135*	41.2	*1179*	359.5	19.8
1314	400.6	*237*	72.3	*1077*	328.4	*55*	16.8	*1259*	383.8	55.5
1315	400.9	*108*	32.9	*1207*	368.0	*36*	11.0	*1279*	389.9	22.0
1300	396.3	*186*	56.7	*1114*	339.6	*48*	14.6	*1252*	381.7	42.1
1290	393.3	*100*	30.5	*1190*	362.8	*35*	10.7	*1255*	382.6	19.8
1295	394.8	*180*	54.9	*1115*	339.9	*60*	18.3	*1235*	376.5	36.6
1300	396.3	*125*	38.1	*1175*	358.2	*20*	6.1	*1280*	390.2	32.0
1325	404.0	*170*	51.8	*1155*	352.1	*30*	9.1	*1295*	394.8	42.7
1335	407.0	*227*	69.2	*1108*	337.8	*50*	15.2	*1285*	391.8	54.0
1335	407.0	*226*	68.9	*1109*	338.1	*44*	13.4	*1291*	393.6	55.5
1335	407.0	*155*	47.3	*1180*	359.8	*66*	20.1	*1269*	386.9	27.1
1335	407.0	*200*	61.0	*1135*	346.0	*45*	13.7	*1290*	393.3	47.3
1330	405.5	*170*	51.8	*1160*	353.7	*46*	14.0	*1284*	391.5	37.8
1330	405.5	*257*	78.4	*1073*	327.1	*73*	22.3	*1257*	383.2	56.1
1330	405.5	*237*	72.3	*1093*	333.2	*33*	10.1	*1297*	395.4	62.2
1325	404.0	*225*	68.6	*1100*	335.4	*89*	27.1	*1236*	376.8	41.5
1325	404.0	*223*	68.0	*1102*	336.0	*61*	18.6	*1264*	385.4	49.4
1325	404.0	*150*	45.7	*1175*	358.2	*27*	8.2	*1298*	395.7	37.5
1325	404.0	*198*	60.4	*1127*	343.6	*47*	14.3	*1278*	389.6	46.0
1325	404.0	*142*	43.3	*1183*	360.7	*38*	11.6	*1287*	392.4	31.7
1350	411.6	*145*	44.2	*1205*	367.4	*39*	11.9	*1311*	399.7	32.3
1345	410.1	*180*	54.9	*1165*	355.2	*57*	17.4	*1288*	392.7	37.5
1345	410.1	*198*	60.4	*1147*	349.7	*53*	16.2	*1292*	393.9	44.2
1340	408.5	*78*	23.8	*1262*	384.8	*4*	1.2	*1336*	407.3	22.6
1325	404.0	*58*	17.7	*1267*	386.3	*1*	0.3	*1324*	403.7	17.4
1325	404.0	*255*	77.7	*1070*	326.2	*23*	7.0	*1302*	397.0	70.7

1315	400.9	*175*	53.4	*1140*	347.6	*24*	7.3	*1291*	393.6	46.0
1320	402.4	*214*	65.2	*1106*	337.2	*19*	5.8	*1301*	396.6	59.5
1310	399.4	*230*	70.1	*1080*	329.3	*15*	4.6	*1295*	394.8	65.5
1305	397.9	*215*	65.5	*1090*	332.3	*22*	6.7	*1283*	391.2	58.8
1305	397.9	*114*	34.8	*1191*	363.1	*1*	0.3	*1304*	397.6	34.5
1310	399.4	*105*	32.0	*1205*	367.4	*23*	7.0	*1287*	392.4	25.0
1305	397.9	*85*	25.9	*1220*	372.0	*6*	1.8	*1299*	396.0	24.1
1310	399.4	*70*	21.3	*1240*	378.0	*26*	7.9	*1284*	391.5	13.4
1310	399.4	*95*	29.0	*1215*	370.4	*22*	6.7	*1288*	392.7	22.3
1315	400.9	*91*	27.7	*1224*	373.2	*14*	4.3	*1301*	396.6	23.5
1315	400.9	*81*	24.7	*1234*	376.2	*35*	10.7	*1280*	390.2	14.0
1315	400.9	*215*	65.5	*1100*	335.4	*24*	7.3	*1291*	393.6	58.2
1310	399.4	*190*	57.9	*1120*	341.5	*30*	9.1	*1280*	390.2	48.8
1305	397.9	*165*	50.3	*1140*	347.6	*24*	7.3	*1281*	390.5	43.0
1310	399.4	*179*	54.6	*1131*	344.8	*20*	6.1	*1290*	393.3	48.5
1320	402.4	*200*	61.0	*1120*	341.5	*34*	10.4	*1286*	392.1	50.6
1320	402.4	*176*	53.7	*1144*	348.8	*30*	9.1	*1290*	393.3	44.5
1320	402.4	*214*	65.2	*1106*	337.2	*43*	13.1	*1277*	389.3	52.1
1315	400.9	*180*	54.9	*1135*	346.0	*38*	11.6	*1277*	389.3	43.3
1305	397.9	*193*	58.8	*1112*	339.0	*40*	12.2	*1265*	385.7	46.6
1305	397.9	*230*	70.1	*1075*	327.7	*39*	11.9	*1266*	386.0	58.2
1315	400.9	*225*	68.6	*1090*	332.3	*34*	10.4	*1281*	390.5	58.2
1305	397.9	*188*	57.3	*1117*	340.5	*26*	7.9	*1279*	389.9	49.4
1310	399.4	*192*	58.5	*1118*	340.9	*30*	9.1	*1280*	390.2	49.4
1310	399.4	*200*	61.0	*1110*	338.4	*77*	23.5	*1233*	375.9	37.5
1325	404.0	*235*	71.6	*1090*	332.3	*35*	10.7	*1290*	393.3	61.0
1325	404.0	*230*	70.1	*1095*	333.8	*44*	13.4	*1281*	390.5	56.7
		Avg.=	*52.5*	Avg.=	*350.1*	Avg.=	*11.3*	Avg.=	*391.3*	*41.2*
		SdevP=	*16.2*	SdevP=	*16.3*	SdevP=	*6.6*	SdevP=	*8.4*	*14.6*

Water bearing formation

Formation	#	%
Overburden	0	0
Bedrock	44	100



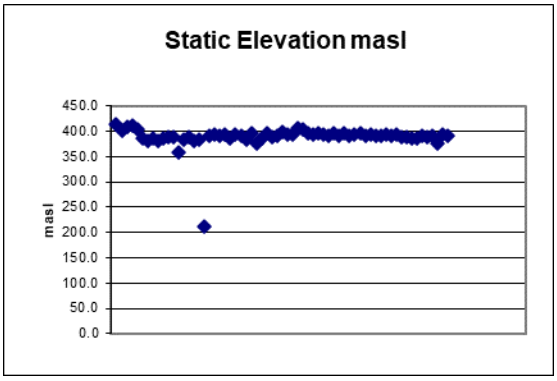


Table D – MOE Water Well Record Statistical Observations

The term aquifer here generally refers to a geologic unit(s) or formation permeable enough to yield economic quantities of water to wells. The term aquitard refers to a geologic unit(s) or formation with insufficient permeability to supply production wells. Aquifers and aquitards are interpreted here based on statistical observation of data contained in the MOE water well records. Hydrographs of water levels are normally not kept for private wells, therefore historical fluctuations in water levels are not known.

3.3 HYDROGEOLOGICAL SETTING

Based on the available information the following comments can be made:

- There are two [2] predominant aquifers in the Study Area, one which is considered a confined aquifer within the limestone bedrock at an estimated depth between 17.7 to 79.0 m bgs, with an average static water level of 11.3m. The other is an unconfined aquifer within the sandy silt, situated at an estimated depth between 2 and 7 m bgs.;
- In each case the aquifer within the limestone bedrock exhibited a positive pressure head [i.e., the static water level is above the elevation where the groundwater was encountered] in each well record, indicating the aquifer was under confined artesian conditions with respect to the confining layer.
- Pressure head (hydraulic head above aquifer) ranged from 13.4 to 71.0 metres with an average of 41.2 metres;
- Recommended available pumping rates ranging between 3.5 and 25 gpm.

Given the above, any active potable water wells in the area would be at greater depths as drilled bedrock wells. Such wells would be drawing water from within the limestone bedrock aquifer. The overburden soils consist of primarily sand and silty sands, with less permeable clayey silt. The shallow groundwater condition on the site is typical of an unconfined near surface aquifer, which would be influenced by seasonal weather conditions, drainage, and the presence of variable more permeable seams in the overburden soils.

4. EARTHWORKS AND SITE GRADING OPERATIONS

Based on the provided preliminary grading plan forwarded to our office by MTE (Project No. 50250-100, F16-FG.dwg) dated April 7, 2022 some cut and fill on the order of 2 to 4 metres will take place. Despite the moderate cut and fill operations, the preliminary grading plan has taken into consideration the groundwater elevations across this parcel of land, such that fill operations will take place on the northern portion of the site where groundwater was noted to be highest and cut operations in the middle and south portions of the site, where groundwater was observed to be deepest. It would be expected that natural surface drainage would result in pooling of water in low spots across the site, which are noted to be within the areas of fill. The predominantly sandy soils on the Clayton Lands will promote natural infiltration and will make site servicing easier, provided that contractors work their way from the low end of the site to the high end of the site.

At this time a preliminary site servicing and grading plan for the Elora Sands has not been provided to our office, as the potential development of those lands is a future

consideration. However, the existing topography of this parcel of land contains larger undulations and changes in elevations. Therefore, it is anticipated that the cut and fill operations for this parcel of land will require more significant regrading. It is recommended that the cut/fill operations be handled in a similar manner as the Clayton Lands, such that fill operations take place where groundwater is shallowest at the northern portion of the site and cut operations take place where the deepest groundwater was encountered at the southern end of the site. As noted above, the Elora Sands generally consists of sandy silt/silty sand within the upper levels, transitioning to a clayey sandy silt with depth, however is more variable at times with clayey or gravelly deposits. As such, 'perched' water deposits within the permeable seams may yield 'wet' excavated material. Contractors should anticipate difficulties with base stabilisation and engineered fill works when work is conducted during the 'wet' times of the year. It is recommended that where possible, earthworks be conducted during the dry summer months. Where engineered fill occurs during the 'wet' times of the year, considerable delays and challenges in achieving effective compaction associated with wet soil conditions may be incurred and should be anticipated. It may be necessary to spread a thin lift of wet backfill to 'air dry' for several days or more if engineered fill is undertaken during the 'wet' times of the year.

5. HYDROGEOLOGICAL CONSIDERATIONS

As noted above, it is understood that the development is anticipated to consist of single-family dwellings and townhouse blocks, including the installation of associated underground municipal services along asphalt paved roadways. Excavations for the proposed development services are expected to extend to depths of up to approximately to 2 to 5 metres below the existing ground surface, while excavations for foundations would be expected to extend up to approximately 1.5 to 2 metres. Measurements of the groundwater level at the monitoring well locations indicate a groundwater level on the order of approximately 2 to 7 metres below the existing ground surface, generally 3.5 to 7 metres over the Clayton lands presently proposed for development. The groundwater level is shallower to the east, approaching the Irvine Creek tributary [Nichol Drain], generally following the drop in topography toward the creek. As the conditions consisted mostly of the permeable sand on the Clayton Lands, the groundwater level between the 'wet' and 'dry' seasons of the year was relatively consistent with little to no fluctuation. These conditions, with relatively permeable soil conditions at depth, and groundwater at sufficient depth, are well suited to proposed development. The generally permeable condition of the native sand deposit present over the site will generally allow for natural drainage and movement of groundwater. As such, it is not considered likely that service trenches would present any conflict or impact to the natural groundwater conditions.

The exception might be deeper trunk sewers, which would warrant closer assessment as the detailed design proceeds.

Shallower groundwater was observed on the Elora Sands at the northern portion of the site where more clayey and gravelly deposits were encountered, as noted above. These deposits are likely to trap and create a 'perched' water condition which may exacerbate the infiltration of groundwater into open excavations, however would likely be able to be handled with conventional dewatering methods and techniques. Furthermore, the fluctuations in groundwater level were higher on the Elora Sands as the soils conditions encountered within the boreholes consisted of more clayey deposits.

The short-term excavations for the proposed servicing are generally anticipated to extend through the permeable sandy soils and into the clayey sandy silt till where deeper excavations are required. Where the site calls for the placement of engineered fill, raising the grade, it would create an even larger separation between the groundwater table and the proposed servicing and foundation construction. Excavations would be expected to be subject to relatively minor groundwater infiltration, such that it should be possibly to adequately control such infiltration using conventional construction dewatering techniques such as pumping from sumps in the base of the excavation. However, during wet times of year and in deeper excavations, some instability of the excavations should be expected. In the event that deeper excavations are required below the groundwater level or where more permeable sand and gravel seams are encountered, a greater rate of infiltration should be anticipated, requiring multiple pumps and possibly more sophisticated dewatering techniques for deeper excavations.

The rate of dewatering would be a function of the time of year, depth of excavation, length of trench opened by the contractor, etc. In most cases it is expected to be below 50,000 L/day, though for deeper excavations may be as much as up to 400,000 L/day. Where dewatering rates of greater than 50,000 L/day are anticipated it would be necessary to file an EASR notice for construction dewatering. However, it is not anticipated that dewatering would be greater than 400,000 L/day, and so the need for a permit to take water [PTTW] is not expected. As noted above, the advancement of a number of test pits, would be prudent to assist in refining the anticipated construction dewatering requirements as the design of the site grading and servicing proceeds.

The layering of sandy and clayey soils encountered specifically on the Elora Sands would allow for some natural drainage and movement of groundwater, however given the high silt content this should not be solely relied upon. As such, excavations may have the potential to intercept shallow groundwater on parts of the site and thus create a "French Drain" within the bedding material, with possible affect to the groundwater.

Consequently, if groundwater is encountered during digging of the service trenches, measures may need to be implemented to mitigate/eliminate groundwater interference. These would include clay cut-offs within the service trench fill encasing the pipe/service. Such clay cut-offs should be installed in accordance with OPSD 80.095, using a suitable clay soil or alternatively a blend of 1 part bentonite chips to 3 parts OPSS Granular A, or suitably clayey soil encountered on site. The need for such measures is best assessed as the detailed design proceeds, and in the field during construction. Regardless, any such locally lowering of the groundwater associated with site servicing would be limited to the near surface soils, and would not be expected to significantly impact the regional groundwater conditions.

Excavations for the proposed basement levels should be well above the groundwater level, pending review of the final site grading plans and foundation depths, along with more detailed assessment such as test pits in the area of observed shallow groundwater levels. With proper consideration to the site grading and design founding elevations, it is not anticipated that foundation excavations would require ongoing groundwater control, other than typical perimeter weeping tile and sump pumps.

The final grading of the site should appropriately consider the groundwater levels in order to minimise or avoid conflict or impact to the groundwater during pre and post construction. In this regard the grading and storm water management plan should accommodate surface runoff that follows the existing overall drainage patterns as much as possible.

It is also noted that the use of Low Impact Design [LID] methods as part of the stormwater management for the proposed development would be viable for much of the site and should be considered. The permeable sand deposit predominantly on the Clayton Lands, above the groundwater level, would afford an opportunity for natural infiltration of surface runoff, such as in 'dry' ponds, infiltration galleries, rear yard infiltration swales or galleries, etc. As noted above, the sand deposit would have hydraulic conductivity on the order of 10^{-2} to 10^{-3} cm/sec, correlating to design infiltration rates on the order of 100 to 300 mm/hr. The use of infiltration systems could be readily utilised for lot level infiltration of rain water from downspouts, and also within the overall SWM plan. The soil conditions on the Elora Sands are more variable and contain more clayey deposits which are considered to have a low permeability characteristic. Preliminary grain size analyses on the clayey sandy silt till indicate a hydraulic conductivity on the order of 10^{-6} to 10^{-8} cm/sec, correlating to design infiltration rates on the order of less than 10 to 15 mm/hr. As such, LID systems aren't recommended where areas of clayey sandy silt till are encountered [generally the lower areas of the site, towards the tributary to Irvine Creek] but should be considered in areas consisting

of the more permeable sandy deposits [generally the higher portions of the site, to the south]. This would be better addressed during the detailed design process, supported with the advancement of test pits at specific locations proposed for LID measures. It is noted that single well response testing will be performed in a number of the monitoring wells installed which will allow for a more accurate estimate of the hydraulic conductivity for the various soil layers.

Based on our observations and details of the proposed development, it is not anticipated that the proposed construction will have an adverse impact on the groundwater condition in the area, provided the comments and recommendations provided in this report are adhered to. There is not expected to be a significant or long-term impact on the development, such as ongoing dewatering, etc., provided the above discussion and recommendations are considered in the site grading, servicing and stormwater design.

As outlined above, the hydrogeological setting of the site is such that potable wells in the area would be drawing from a deep confined bedrock aquifer, and would be largely unaffected by potential construction activities encountering the shallow near surface groundwater regime. Construction of the proposed development would involve relatively shallow excavations only, with limited interaction with the shallow groundwater regime, and would not have an impact on deeper supply aquifers. As such, there would be no anticipated negative impact from the proposed development on nearby potable wells, including municipal supply wells. Further, as the proposed development would be provided with municipal water supply, there would be no impact to potential supply aquifers or associated water wells in the area, if any.

It is noted that the subject lands are within a Wellhead Protection Area (WHPA). However, based on the comments noted above, there will be no anticipated negative impact with respect to the deep bedrock aquifer serving as the potable supply source for private and municipal potable wells within the area.

6. STORMWATER MANAGEMENT (SWM) POND DESIGN CONSIDERATIONS

As noted above, the static groundwater level at the northern portion of the Elora Sands is on the order of 0.5 to 4.5 metres below the existing ground surface, at a relative elevation of roughly 403 to 401 metres, based on the available groundwater data to date. The groundwater charts for the monitoring wells at these locations have illustrated the large fluctuations that are experienced during the ‘wet’ and ‘dry’ seasons of the year. At this time the design details of the proposed SWM pond proposed at the north edge of the Elora Sands are not known, however it is anticipated that the pool will have a

permanent pool elevation near the observed groundwater level, and the use of an impermeable liner would be expected to be required.

In general, where the permanent pool elevation is below the static groundwater elevation, it will be necessary to provide a low permeability layer over the base of the pond to resist the infiltration of natural groundwater, and of sufficient weight to resist the hydrostatic uplift pressures. Conversely, where the permanent pool elevation is above the static groundwater level, a low permeability liner will be required to prevent the exfiltration of water out of the pond. This could be accomplished through the use of a compacted clay liner, or with a weighed down proprietary liner system, etc. The weight of the liner system would have to exceed the uplift pressure of the ground water during the most severe periods of the year, likely when maximum storage is required. In approximate terms for example, one metre of clay liner, or equivalent, would be required for about every two meters of water storage below static ground water level, i.e., when the water level in the pond is 2 metres below the static ground water table, the clay liner would have to be at least one metre thick; if 3 metres below the static level, then 1.5 metres thick, etc.

Where the permanent pool elevation is below the static groundwater elevation, it will be necessary to provide a low permeability layer over the base of the pond to resist the infiltration of natural groundwater, and of sufficient weight to resist the hydrostatic uplift pressures. Conversely, where the permanent pool elevation is above the static groundwater level, a low permeability liner will be required to prevent the exfiltration of water out of the pond. This could be accomplished through the use of a compacted clay liner, or with a weighed down proprietary liner system, etc. The weight of the liner system would have to exceed the uplift pressure of the ground water during the most severe periods of the year, likely when maximum storage is required. In approximate terms for example, one metre of clay liner, or equivalent, would be required for about every two meters of water storage below static ground water level, i.e., when the water level in the pond is 2 metres below the static ground water table, the clay liner would have to be at least one metre thick; if 3 metres below the static level, then 1.5 metres thick, etc. It is recommended that best efforts be made to design the static pool elevation close to the static groundwater elevation so that the natural seasonal fluctuations of the groundwater elevation dictate the permanent pool elevation. This would eliminate the need to construct a weighted liner to resist the hydrostatic uplift pressures of the static groundwater elevation. That being said, this would only work if the former solution could be achieved whilst attaining the required water storage volume for the development.

An impermeable compacted clay liner would consist of a sufficiently plastic clay soil, with a recommended minimum clay content of 20 per cent and plasticity index of 7. Based on the current laboratory testing of the native soils, the majority of the clayey silt soils are generally suitable for use as an impermeable liner for the proposed SWM ponds, however any sandy deposits or silt material encountered should be selectively sorted and separated from its distinctly different counterpart to avoid use of the more permeable material. As such, during site grading and servicing activities, it would be prudent to stockpile such clayey soil near the area of the proposed SWM pond for use as such an impermeable liner. Additional testing may then be conducted on the stockpiled material, to confirm its suitability for use as an impermeable clay liner.

As noted above, the clayey soils encountered might be suitable for use as an impermeable clay liner but would require additional testing on at the specific location of the SWM pond. The base of the SWM pond may be prepared by scarifying or 'discing' in the upper perhaps 0.3 to 0.5 metres to destroy any natural layering structure, moisture conditioned to within -2 to +4 per cent of its optimum moisture content, and recompacted in place, however the soils present at the proposed base of the SWM pond should be confirmed. In the event that an imported clayey soil is required for use as an impermeable liner, the clay liner should be placed in nominal lifts of 300 millimetres, sufficiently worked and moisture conditions as noted above, and compacted to 95 per cent of its SPMDD. It is noted as well, regardless of the provision of an impermeable liner, the sides of the pond should be well worked or scarified to destroy any natural layers or seams, specifically any more permeable sandy or gravely seams. Where such layers are encountered, a layer of available on-site clayey soil should be placed and compacted, as outlined above, to restrict the natural infiltration of groundwater into the pond through these more permeable horizontal seams.

Alternatively, weighed down proprietary liners could be considered, however the suppliers of such materials (such as Layfield, Terrafix, Suprema) would have to be consulted for recommendations on the appropriate product and installation methods for the site conditions. Such artificial liners would not require compaction efforts and could be weighed down with practically any available soil or granular material.

Interior pond slopes beneath the permanent pool elevation should be limited to inclinations no steeper than 4 horizontal to 1 vertical, with interior slopes above permanent pool elevation and exterior slopes no steeper than 3 horizontal to 1 vertical. Should steeper slopes be required, it will be necessary to provide some form of stabilisation such as the placement of coarse 'rip rap' stone, or proprietary product such as Turfstone or Cable-Crete, or construction as a reinforced earth embankment. It is recommended that all interior pond slopes be provided with at least some form of

nominal stabilisation/protection to control loss erosion/loss of ground. Above the pond level this may consist of appropriate vegetation.

Material utilised in construction of pond slopes must be free of significant organic deposits, construction debris, or any other deleterious materials which would affect stability of the pond walls. Our office should be retained to review any imported material to the site, as well as to provide quality control services during construction.

It is also noted that appropriate care and effort will be required by the contractor around inlet and outlet structures to ensure the impermeable liner is continuous and avoid the potential of 'piping'. In this regard the clay liner should be completely constructed prior to the installation of inlet/outlet structures. A bentonite clay material could be utilised within the fill around any structures to provide a continuous impermeable seal.

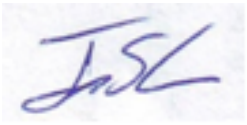
7. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Scott Wylie, B.Eng., EIT.



Ian Shaw, P. Eng., QP_{ESA}
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Drawing No. 2, Groundwater Contour Map
Drawing No. 3, Water Well Records
Drawing Nos. 4, 5 and 6, Geologic Cross Sections
Log of Borehole Nos. 001 to 007, 101 to 104, 201 to 206, 301 to 307 and 401, inclusive
Grain Size Analyses

Distribution: Cachet Developments [pdf]

LEGEND

- Borehole Location — BH#
- Monitoring Well Location — MW#
- Geological Cross Section Location

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301591-G.

2. Borehole and monitoring well locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Nichol Road 15
Elora, Ontario

Borehole Location Plan

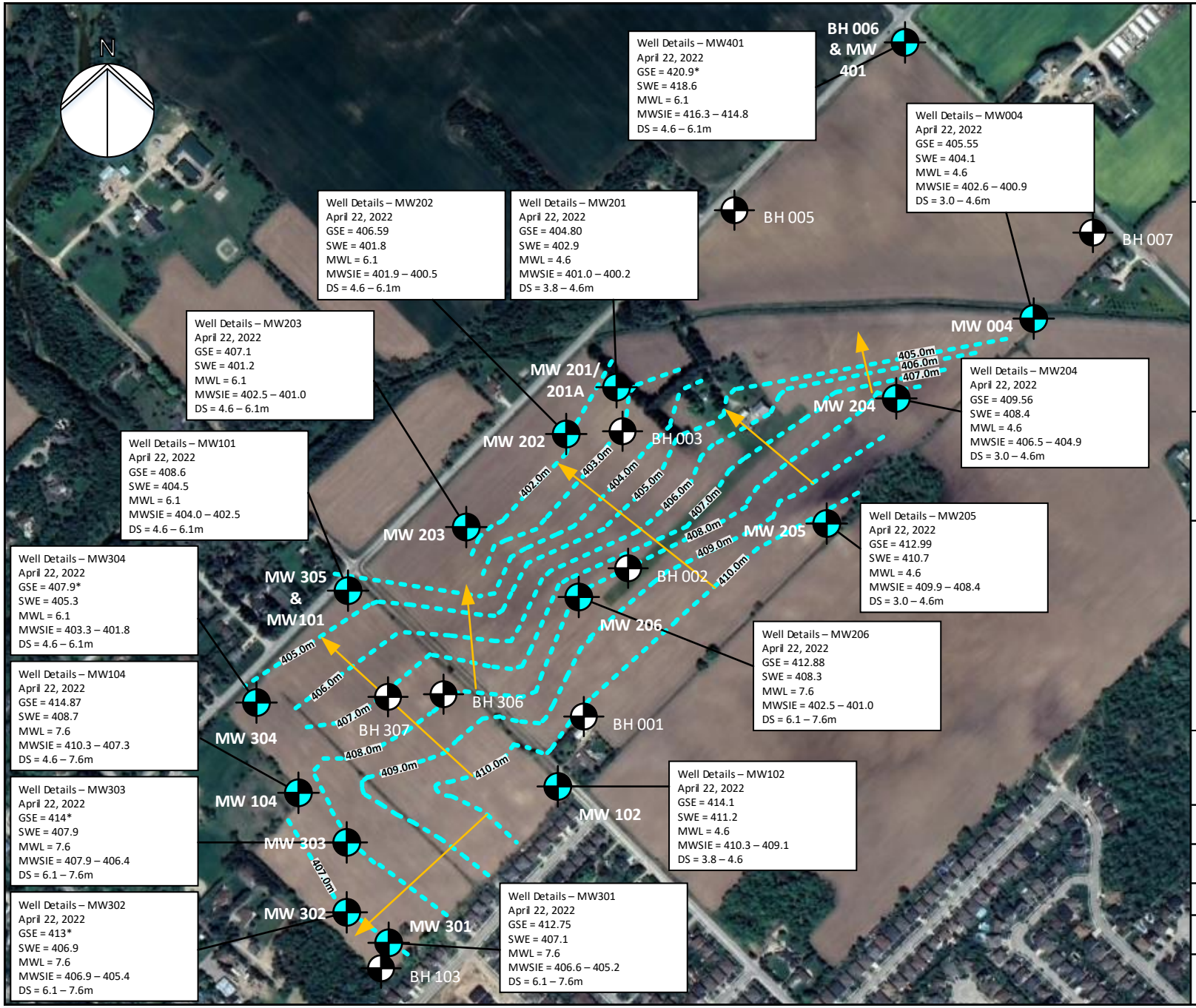
Project No. SM 301591-G

Date: June 2022

Drawn: SW | Checked: IS

SM 301591-G Borehole Location Plan

Drawing No. 1



LEGEND

Monitoring Well Location

MW#

GSE = Monitoring Well Ground Surface Elevation
SWE = Static Water Elevation [taken on April 22, 2022]
MWL = Monitoring Well Length
MWSIE = Monitoring Well Screen Interval Elevation
DS = Depth of Screen

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301591-G.

2. Borehole and monitoring well locations are approximate.

*GSE interpolated between contour lines from topographic survey

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Nichol Road 15
Elora, Ontario

Groundwater Contour Map

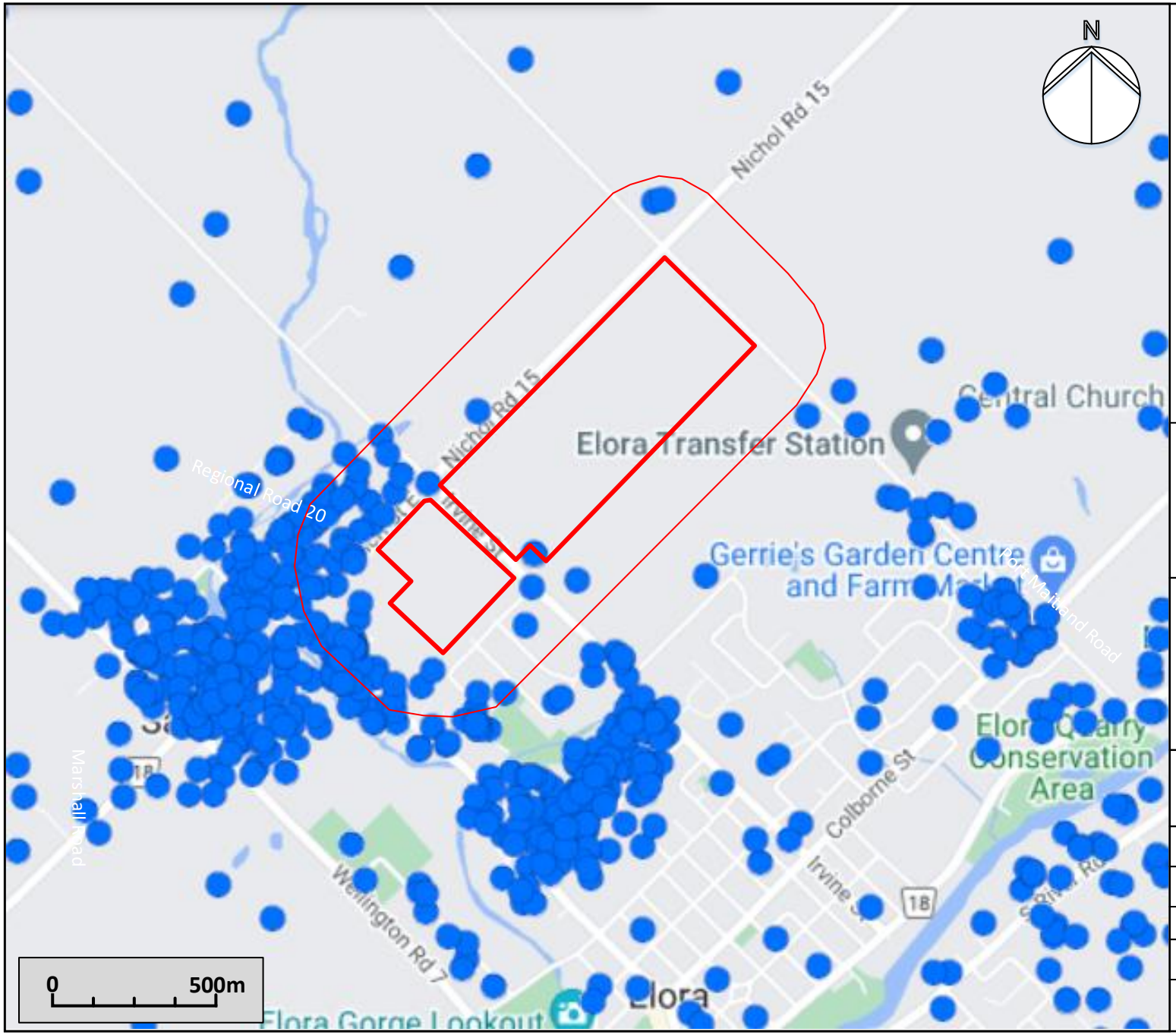
Project No. SM 301591-G

Date: June 2022

Drawn: SW | Checked: IS

SM 301591-G Groundwater Contour Map

Drawing No. 2



LEGEND

= Site

= Well Record

= Study Area

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Groundwater Well Survey
Proposed Residential Development
Nichol & Clayton Lands
Elora, Ontario

Ministry of the Environment
Water Well Records Plots

Project No. SM 302951-E

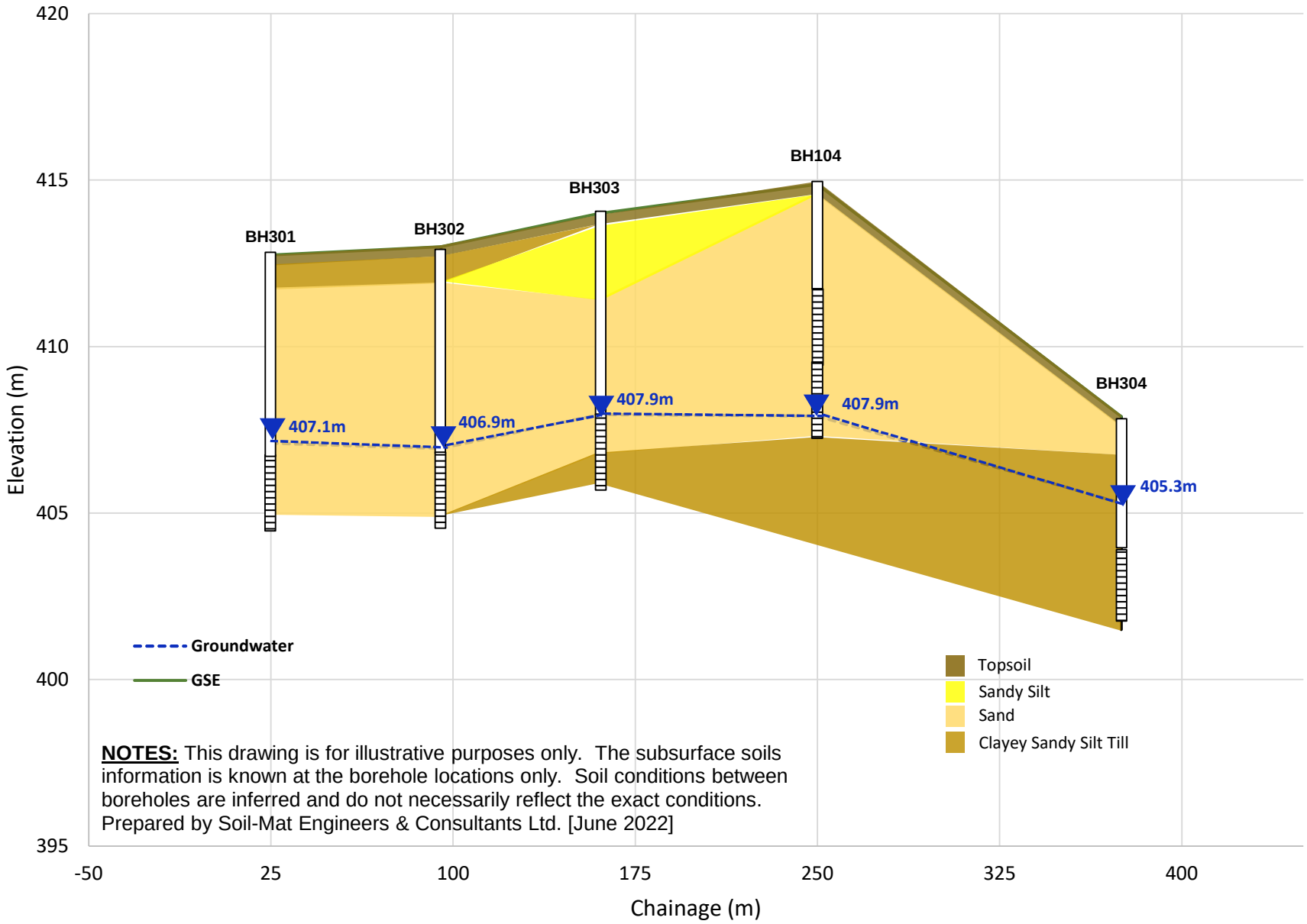
Date: July 2022

Drawn: PM | Checked: IS

SM 302951-E Water Well Records

Drawing No. 3

Geological Cross Section A-A

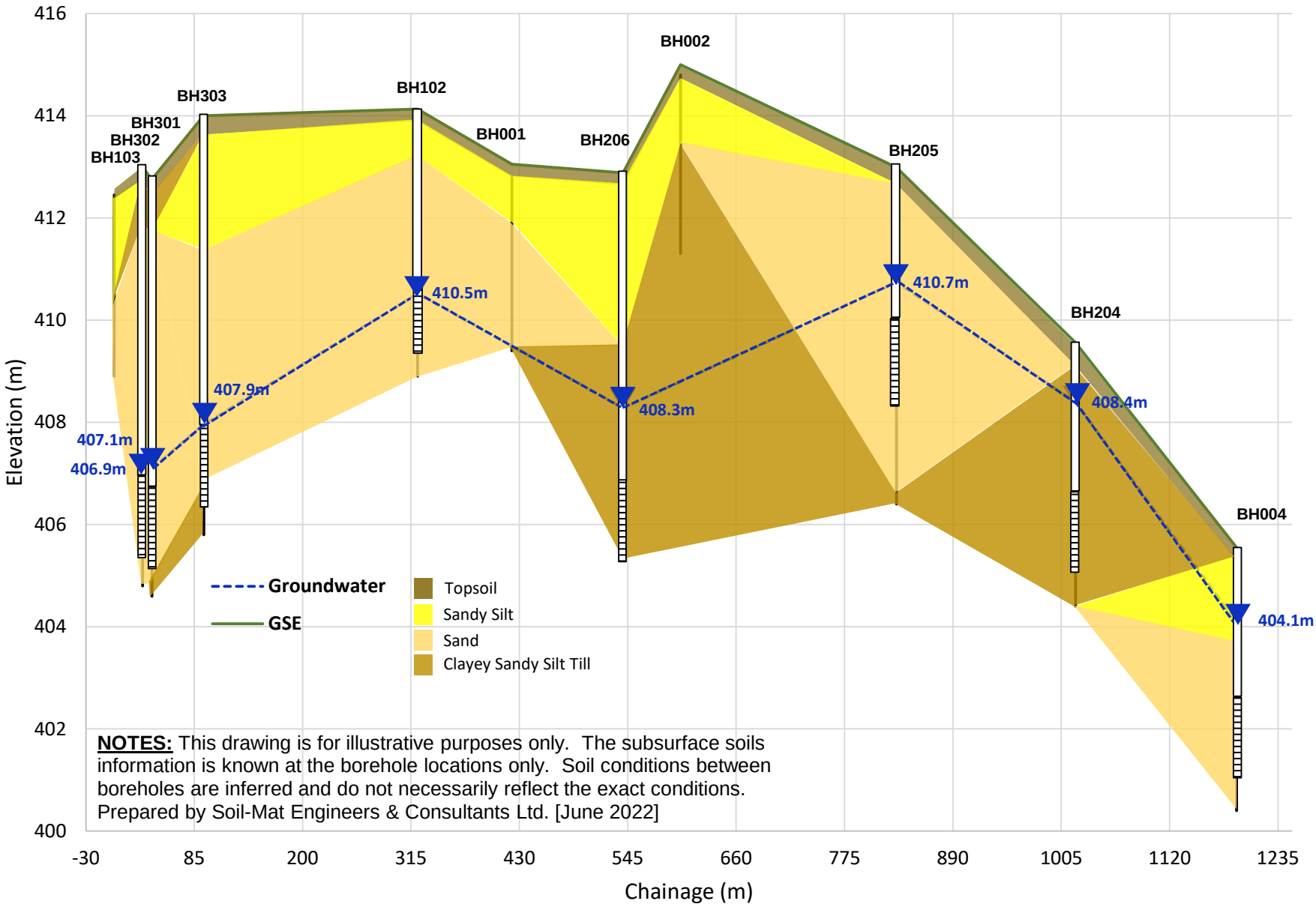


NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [June 2022]

Drawing No. 4

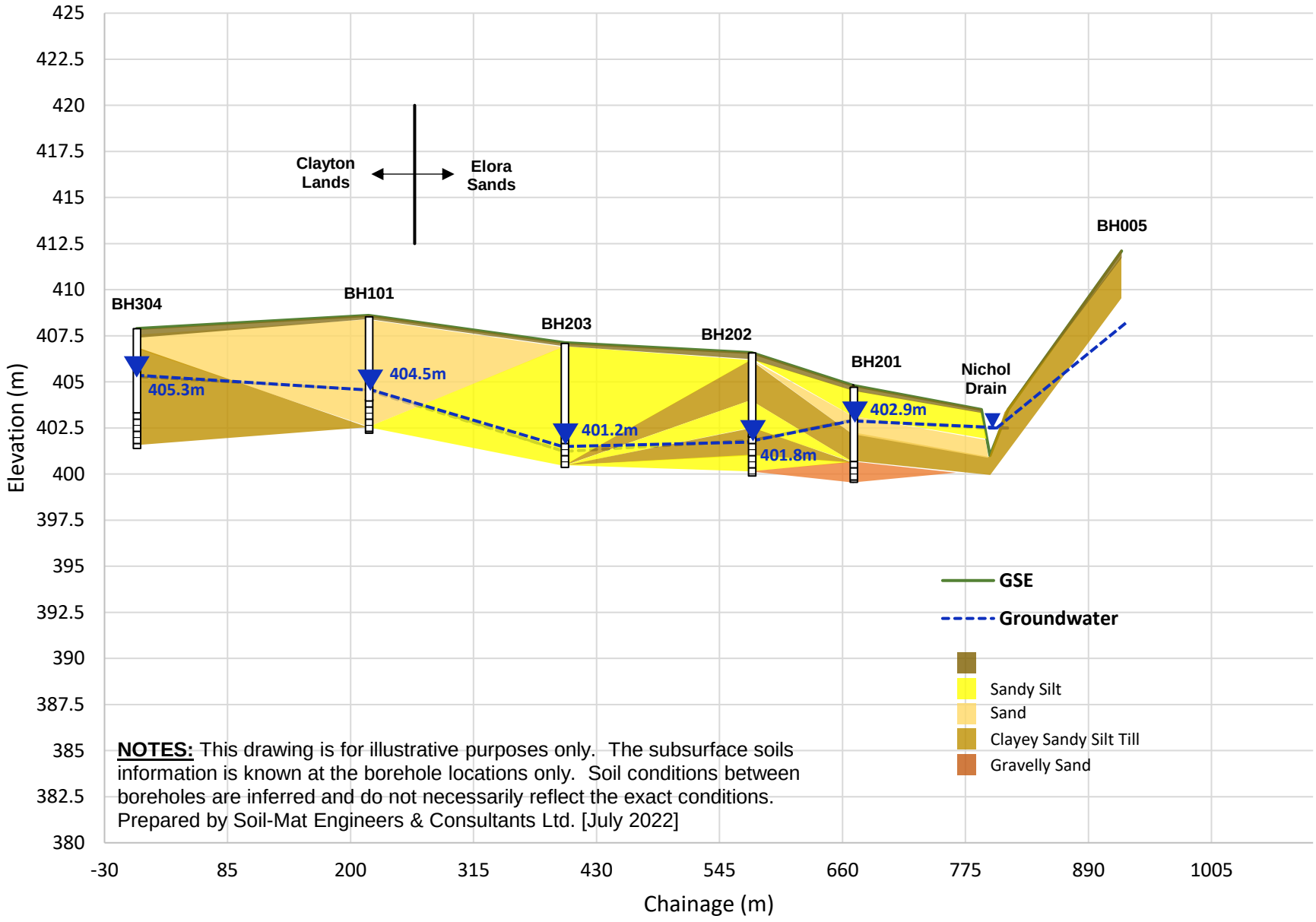
Project No. SM 301951-G

Geological Cross Section B-B



NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [June 2022]

Geological Cross Section C-C



NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [July 2022]

Log of Borehole No. 001

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838268
E: 545454

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		413.05		Ground Surface								
0	0	412.80		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	4 5 7 6	12			
3	1	411.90		**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, compact.		SS	2	6 7 6 6	13			
				Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, compact.		SS	3	5 8 12 14	20			
10	3					SS	4	12 10 13 10	23			
11		409.40				SS	5	6 11 13 15	24			
12	4			End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as dry and caved to a depth of 1.5 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

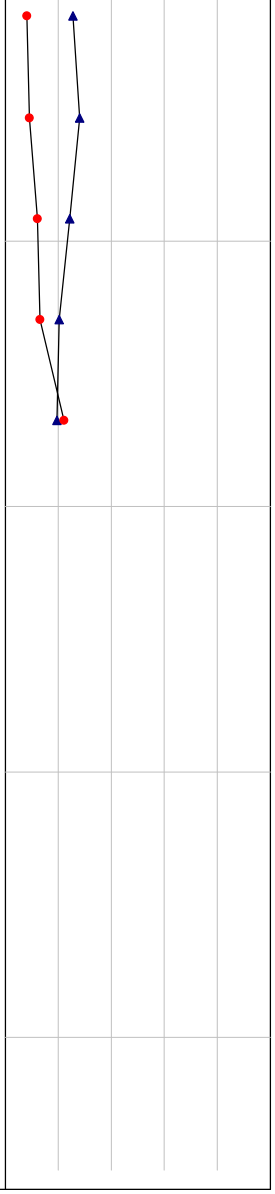
Log of Borehole No. 002

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838469
E: 545516

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		415.00		Ground Surface								
0	0	414.80		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	2 4 4 5	8			
				Sandy Silt Brown, reworked in upper levels, trace clay, silt, and gravel, loose.		SS	2	4 3 6 8	9			
		413.50		**Clayey Sandy Silt Till** Brown, trace to some gravel, stiff to very stiff.		SS	3	6 6 6 7	12		3.5	
		412.50		Transition to grey.		SS	4	3 7 6 7	13		4.0	
		411.30		End of Borehole		SS	5	9 7 15 18	22		>4.5	

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.7 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 003

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838652
E: 545505

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
		409.93		Ground Surface									
0	0			**Topsoil** Approximately 150 millimetres of topsoil.		SS	1	4 6 10 8	16				
3	1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, compact.		SS	2	6 10 10 7	20				
6	2	408.10 407.80		**Clayey Sandy Silt Till** Brown, trace to some gravel, compact.		SS	3	6 8 10 11	18				
				End of Borehole									

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 2.1 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 004

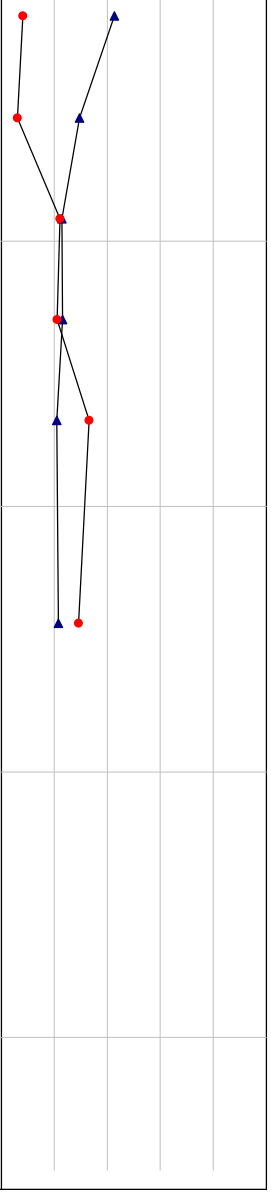
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838792
E: 546044

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	405.55	Ground Surface								
0 / 0	405.35	**Topsoil** Approximatelty 200 millimetres of topsoil.								
3 / 1		**Sandy Silt** Brown, trace to some clay, trace gravel, reworked in upper levels, loose.		SS	1	2 3 5 6	8			
4 / 1				SS	2	4 3 3 5	6			
6 / 2	403.70	**Sand** Brown, trace clay, silt, and gravel, medium to coarse gradation, wet, compact to dense.		SS	3	8 10 12 15	22			
9 / 3				SS	4	8 10 11 10	21			
11 / 3				SS	5	8 10 23 30	33			
16 / 5	400.70	Transition to grey.		SS	6	3 11 18 23	29			
16 / 5	400.40	End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 5, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as open and 'wet' at a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 2.74 metres below ground surface.

August 27, 2021 - 1.75 metres below ground surface.

February 23, 2021 - 1.33 metres below ground surface.

April 22, 2022 - 1.47 metres below ground surface.

June 1, 2022 - 1.78 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 5, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 005

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838939
E: 545636

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 / 0	412.10		Ground Surface									
0 / 0	411.90		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	2 4 5 7	9				
3 / 1			**Clayey Sandy Silt Till** Brown, reworked in upper levels, trace to some gravel, increasing clay content with depth, loose to compact.		SS	2	1 3 3 5	6				
6 / 2	410.00				SS	3	3 5 7 9	12				
			End of Borehole									

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 2.1 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 006

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4839162
E: 545871

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
ft m	420.91		Ground Surface								
0 0	420.70		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	4 4 4 4	8			
1			**Sand** Brown, reworked in upper levels, trace rootlets, loose to compact.		SS	2	3 5 6 6	11			
2 1	419.40		**Clayey Sandy Silt Till** Brown, trace gravel, increasing clay content with depth, loose to compact.		SS	3	5 6 6 7	12			
3					SS	4	3 4 4 4	8			
4	417.30				SS	5	5 11 10 15	21			
5			End of Borehole								
6											
7											
8											
9											

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as wet at depth of 2.0 metres, and caved to a depth of 2.4 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

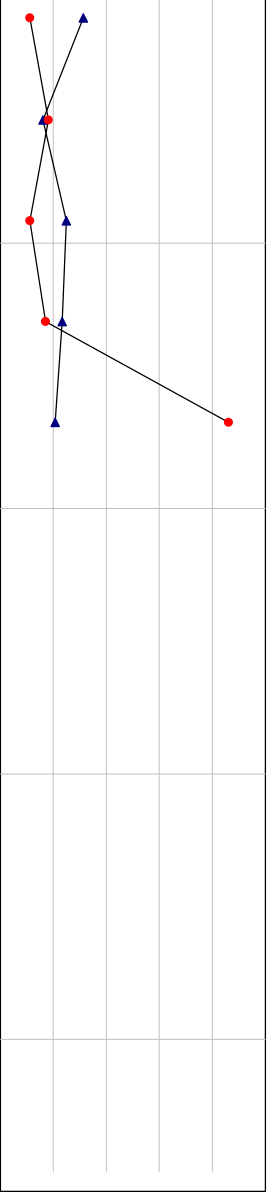
Log of Borehole No. 007

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838910
E: 546126

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	408.39	Ground Surface								
0 / 0	408.10	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	3 5 6 7	11			
3 / 1	406.90	**Sandy Silt** Brown, trace rootlets, trace clay, reworked in upper levels, increasing clay content with depth, compact.		SS	2	10 8 10 10	18			
6 / 2		**Clayey Sandy Silt Till** Brown, trace to some gravel, stiff to hard.		SS	3	3 5 6 6	11		2.0	
9 / 3				SS	4	5 7 10 18	17		2.5	
11 / 3	404.70			SS	5	24 36 50/5"	100		>4.5	
12 / 4		End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.0 metres.

2. Borehole was recorded as open and dry upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 101

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838437
E: 545149

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE: Type	SAMPLE: Number	SAMPLE: Blow Counts	SAMPLE: Blows/300mm	SAMPLE: Recovery	SAMPLE: PP (kgf/cm2)	SAMPLE: U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 ft / 0 m	408.60		Ground Surface									
0	408.30		**Topsoil** Approximately 250 millimetres of topsoil.									
1 – 3 ft / 1 m			**Sand** Brown, trace gravel.									
2 m												
3 m												
4 m												
5 m	403.10		Transition to grey in colour									
6 m	402.50		End of Borehole									

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 6.10 metres.
2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. No soil samples were retrieved. The following free groundwater level readings have been measured:

August 6, 2021 - 4.78 metres below ground surface.

August 27, 2021 - 4.71 metres below ground surface.

October 14, 2021 - 4.33 metres below ground surface.

February 23, 2022 - 4.31 metres below ground surface.

April 22, 2022 - 4.07 metres below ground surface.

June 1, 2022 - 4.15 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 102

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838180
E: 545422

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		414.13	Ground Surface							
0	0	413.90	**Topsoil** 250 millimetres of topsoil.							
		413.20	**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, loose to compact.							
			Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, loose to compact.	SS	1	4 5 7 8	12			
				SS	2	2 3 6 5	9			
				SS	3	3 9 12 14	21			
				SS	4	7 8 11 10	19			
				SS	5	6 9 11 17	20			
				SS	6	7 5 4 9	9			
		408.90	End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 5.2 metres.
2. Borehole was recorded as caved to a depth of 3.8 metres and 'wet' at a depth of 3.6 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 3.58 metres below ground surface.
August 27, 2021 - 3.61 metres below ground surface.
October 14, 2021 - 3.62 metres below ground surface.
February 23, 2021 - 3.5 metres below ground surface.
April 22, 2022 - 2.89 metres below ground surface.
June 1, 2022 - 3.05 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 103

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4837942
E: 545194

Depth (ft)	Depth (m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.55	Ground Surface								
0	0		**Topsoil** Approximately 100 millimetres of topsoil.		SS	1	5 5 7 8	12			
3	1		**Sandy Silt** Brown, trace to some gravel and clay, reworked in upper levels, compact.		AS	2	6 5 3 3	8			
6	2				SS	3	5 6 6 6	12			
		410.30									
9	3		**Sand** Brown, trace clay, silt, and gravel, medium gradation, loose.		SS	4	2 3 3 2	6			
11					SS	5	2 1 1 2	2			
		408.90									
12	4		End of Borehole								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded dry and caved to a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

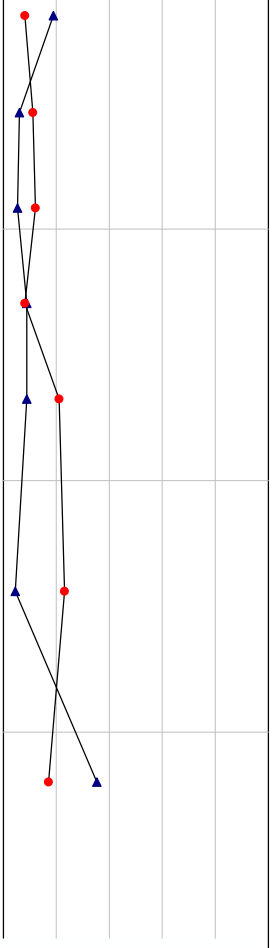
Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 104

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838174
E: 545084

Depth (ft)	Depth (m)	Elevation (m)	Description	Sample Type	Sample Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		414.87	Ground Surface							
0	0	414.60	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, fine to medium gradation, compact.	SS	1	5 5 6 7	11			
2										
3	1			SS	2	8 9 9 7	18			
4										
5				SS	3	2 5 8 7	13			
6	2									
7				SS	4	6 11 16 13	27			
8										
9				SS	5	10 12 11 13	23			
10	3									
11										
12										
13	4									
14										
15				SS	6	5 10 13 15	23			
16										
17	5									
18										
19										
20	6	408.80	Wet spoon							
21				SS	7	9 9 8 6	17			
22										
23	7									
24		407.30								
25			End of Borehole							
26	8									
27										
28										
29										
30	9									
31										



NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 7.6 metres.

2. Borehole was recorded as open and 'wet' at depth of 7.0 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 6.78 metres below ground surface.

August 27, 2021 - 6.96 metres below ground surface.

October 14, 2021 - 7.09 metres below ground surface.

February 23, 2022 - 6.83 metres below ground surface.

April 22, 2022 - 6.13 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 201

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838708
E: 545501

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	404.80	Ground Surface							
1 / 0	404.35	**Topsoil** Approximately 450 millimetres of topsoil.	SS	1	5,3,3,3	6			
3 / 1	403.10	**Sandy Silt/Silty Sand** Brown, trace to some clay and gravel, loose.	SS	2	2,4,5,6	9			
7 / 2	402.20	**Sand** Brown, loose.	SS	3	6,12,18,20	30			
13 / 4	400.70	**Clayey Sandy Silt Till** Brown, some gravel, ocasional cobbles, compact to dense	SS	4	10,9,9,13	18			
16 / 5	399.60	**Gravely Sand** Brown, trace silt, compact.							
		End of Borehole							

Well Data: Ø 50 mm PVC

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 16, 2022 to termination at a depth of 5.2 metres.

2. Borehole was recorded as caved to a depth of 3.0 metres and 'wet' at a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 2.69 metres below ground surface.

April 22, 2022 - 1.88 metres below ground surface.

June 1, 2022 - 2.44 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 16, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 201A

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838708
E: 545501

Depth ft	Depth m	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	SAMPLE PP (kgf/cm2)	SAMPLE U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0	0	404.75		Ground Surface									
10	3	401.70		End of Borehole									

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 16, 2026 to termination at a depth of 3.1 metres.

2. Soil samples will be discarded after 3 months unless otherwise directed by our client.

3. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - dry

April 22, 2022 - 2.05 metres below ground surface.

June 1, 2022 - 2.43 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 16, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 202

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838647
E: 545436

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	406.59	Ground Surface								
0 / 0	406.14	**Topsoil** Approximately 450 millimetres of topsoil.								
1 / 0		**Clayey Sandy Silt Till** Brown, some gravel, compact.		SS	1	2,2,3,2	5			
5 / 1				SS	2	4,7,9,12	16			
8 / 2	404.00	**Sandy Silt** Brown, dense.		SS	3	21,19,18,24	37			
13 / 4	402.50	**Clayey Sandy Silt Till** Brown, some gravel and sand, very dense dense		SS	4	10,24,50/4	100			
18 / 5	401.00	**Sandy Silt** Brown, very dense.		SS	5	34,50/4	100			
20 / 6	400.20	End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 17, 2022 to termination at a depth of 6.4 metres.

2. Borehole was recorded as open and 'wet' at a depth of 0 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 5.5 metres below ground surface.

April 22, 2022 - 4.76 meters below ground surface.

June 1, 2022 - 5.43 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 17, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 203

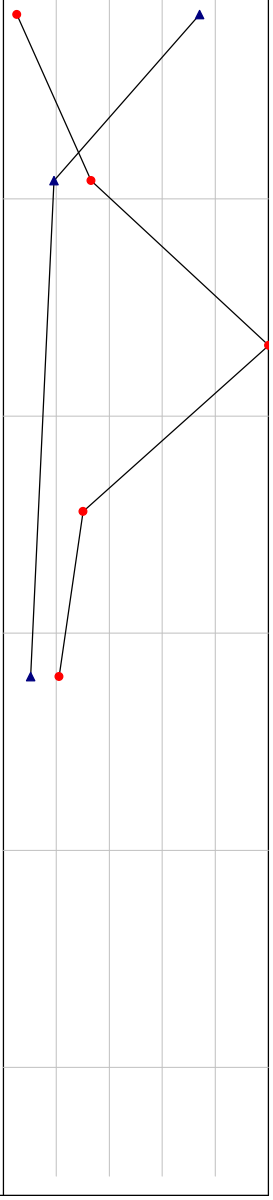
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838523
E: 545307

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	407.13	Ground Surface								
0 / 0	406.88	**Topsoil** Approximately 250 millimetres of topsoil.								
1 / 0		**Sandy Silt** Brown, trace to some gravel, frequent cobbles, loose to very dense.		SS	1	9,3,2,1	5			
2 / 1										
3 / 1				SS	2	8,16,17,27	33			
4 / 1										
5 / 2										
6 / 2				SS	3	50/6	100			
7 / 2										
8 / 3										
9 / 3				SS	4	36,15,15,8	30			
10 / 3										
11 / 4										
12 / 4				SS	5	7,9,12,14	21			
13 / 4										
14 / 5										
15 / 5										
16 / 5										
17 / 5										
18 / 6										
19 / 6										
20 / 6										
21 / 6	400.40									
22 / 7		End of Borehole								
23 / 7										
24 / 7										
25 / 7										
26 / 8										
27 / 8										
28 / 8										
29 / 8										
30 / 9										
31 / 9										
32 / 9										
33 / 10										
34 / 10										
35 / 10										
36 / 11										

Moisture Content w%: 10 20 30 40

Standard Penetration Test blows/300mm: 20 40 60 80



NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 17, 2022 to termination at a depth of 6.7 metres.

2. Borehole was recorded as open and 'wet' at a depth of 0 metres upon completion and backfilled as per Ontario Regulation 903.

3 Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - dry

April 22, 2022 - 5.9 metres below ground surface.

June 1, 2022 - 5.91 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 16, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 204

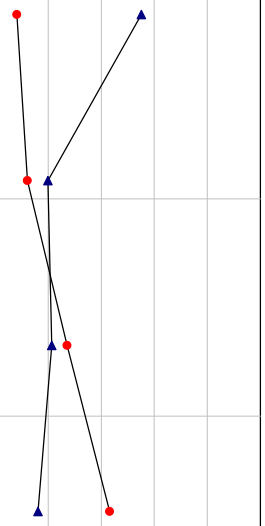
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838693
E: 545861

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	409.56	Ground Surface								
0 / 0	409.16	**Topsoil** Approximately 400 millimetres of topsoil.								
1 / 0		**Clayey Sandy Silt Till** Brown, trace to some gravel, compact to dense.		SS	1	9,4,4,4	8			
2 / 1										
3 / 1				SS	2	4,5,7,17	12			
4 / 1										
5 / 2				SS	3	5,7,20,29	27			
6 / 2										
7 / 3				SS	4	15,21,22,36	43			
8 / 3	404.40	End of Borehole								
9 / 4		NOTES: 1. Borehole was advanced using hollow stem auger equipment on February 18, 2022 to termination at a depth of 5.2 metres. 2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903. 3. Soil samples will be discarded after 3 months unless otherwise directed by our client. 4. A monitoring well was installed. The following free groundwater level readings have been measured: February 17, 2022 - 2.81 metres below ground surface. April 22, 2022 - 1.16 metres below ground surface. June 1, 2022 - 1.53 metres below ground surface.								
10 / 5										
11 / 6										
12 / 7										
13 / 8										
14 / 9										
15 / 10										
16 / 11										
17 / 12										
18 / 13										
19 / 14										
20 / 15										
21 / 16										
22 / 17										
23 / 18										
24 / 19										
25 / 20										
26 / 21										
27 / 22										
28 / 23										
29 / 24										
30 / 25										
31 / 26										
32 / 27										
33 / 28										
34 / 29										
35 / 30										
36 / 31										

Moisture Content w%
10 20 30 40

Standard Penetration Test blows/300mm
20 40 60 80



Drill Method: Hollow Stem Augers
Drill Date: February 18, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 205

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838523
E: 545777

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.99	Ground Surface							
0	0	412.74	**Topsoil** Approximately 250 millimetres of topsoil.							
			Sand Brown, loose.	SS	1	6,5,3,2	8			
				SS	2	4,4,4,4	8			
				SS	3	4,4,5,6	9			
				SS	4	3,3,4,6	7			
		406.60		SS	5	5,4,50/5	100			
		406.40	**Clayey Sandy Silt Till** Brown, trace to some gravel, very dense.							
			End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 18, 2022 to termination at a depth of 6.6 metres.

2. Borehole was recorded as 'dry' and caved to a depth of 4.8 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 2.56 metres below ground surface.

April 22, 2022 - 2.25 metres below ground surface.

June 1, 2022 - 2.39 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 18, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 206

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838460
E: 545394

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	412.88	Ground Surface							
0 / 0	412.58	**Topsoil** Approximately 300 millimetres of topsoil.							
		Sandy Silt Brown, trace to some clay and gravel, compact.	SS	1	11,11,5,2	16			
			SS	2	7,7,8,9	15			
	409.50		SS	3	3,4,10,12	14			
		Clayey Sandy Silt Till Brown, trace to some gravel, compact to dense.	SS	4	10,15,24,30	39			
	405.30	End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 18, 2022 to termination at a depth of 7.6 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 6.83 metres below ground surface.

April 22, 2022 - 4.6 metres below ground surface.

June 1, 2022 - 4.66 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 18, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

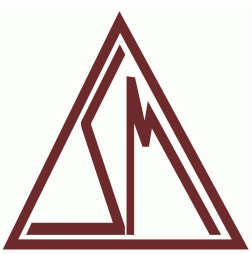
Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 301

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4837975
E: 545199



Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.75	Ground Surface							
0	0	412.50	**Topsoil** Approximately 250 millimetres of topsoil.							
3	1	411.70	**Clayey Sandy Silt Till** Brown, trace gravel, loose .	SS	1	2,1,3,4	4			
			Sand Brown, loose to compact.	SS	2	1,3,6,9	9			
	3			SS	3	7,7,6,9	13			
	4			SS	4	8,9,13,15	22			
	6			SS	5	6,7,10,13	17			
25	7	404.90								
26	8	404.60	**Clayey Sandy Silt Till** Brown, trace gravel, dense to very dense.	SS	6	3,13,32,42	45			

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 22, 2022 to termination at a depth of 8.2 metres.
2. Borehole was recorded as open and 'wet' at a depth of 6.3 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 6.29 metres below ground surface.

April 22, 2022 - 5.65 metres below ground surface.

June 1, 2022 - 5.71 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 22, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 302

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838015
E: 545142

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	413.00	Ground Surface							
0 / 0	412.75	**Topsoil** Approximately 250 millimetres of topsoil.							
3 / 1	411.90	**Clayey Sandy Silt Till** Brown, trace gravel, loose .							
		Sand Brown, loose to compact.	SS	1	2,2,4,9	6			
			SS	2	2,4,6,8	10			
10 / 3			SS	3	5,7,8,15	15			
16 / 5			SS	4	5,8,9,11	17			
20 / 6			SS	5	10,10,11,15	21			
26 / 8	404.80		SS	6	5,8,10,8	18			
		End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 22, 2022 to termination at a depth of 8.2 metres.
2. Borehole was recorded as open and 'wet' at a depth of 6.6 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 6.62 metres below ground surface.

April 22, 2022 - 6.06 metres below ground surface.

June 1, 2022 - 6.12 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 22, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 303

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838108
E: 545144

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	414.00	Ground Surface							
0 / 0	413.65	**Topsoil** Approximately 350 millimetres of topsoil.							
1 / 0		**Sandy Silt** Brown, trace gravel and clay, loose .	SS	1	3,2,2,3	4			
2 / 1									
3 / 1			SS	2	2,3,4,6	7			
4 / 2									
5 / 2	411.40	**Sand** Brown, loose.	SS	3	2,2,3,4	5			
6 / 3									
7 / 4			SS	4	3,2,4,6	6			
8 / 4									
9 / 5			SS	5	2,2,3,4	5			
10 / 6									
11 / 6	406.80	**Clayey Sandy Silt Till** Brown, trace gravel, dense.							
12 / 7			SS	6	13,19,23,31	42			
13 / 8	405.80	End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 22, 2022 to termination at a depth of 8.2 metres.
2. Borehole was recorded as open and 'wet' at a depth of 5.4 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 5.4 metres below ground surface.

April 22, 2022 - 6.04 metres below ground surface.

June 1, 2022 - 6.11 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 22, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

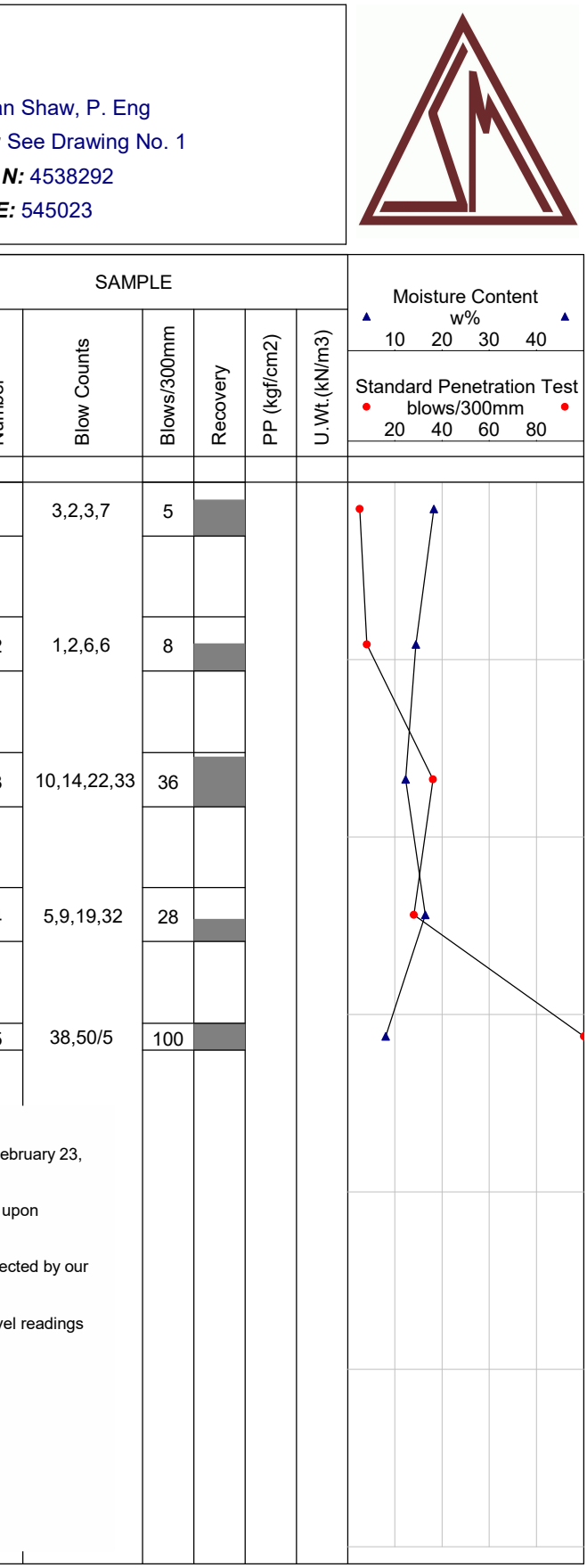
Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 304

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4538292
E: 545023



NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 23, 2022 to termination at a depth of 6.4 metres.

2. Borehole was recorded as open and 'wet' at a depth of 2.8 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 2.87 metres below ground surface.

April 22, 2022 - 2.6 metres below ground surface.

June 1, 2022 - 2.96 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 23, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 305

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838438
E: 545144

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	408.60	Ground Surface							
0 / 0	408.35	**Topsoil** Approximately 250 millimetres of topsoil.	AS	1					
1 / 0		**Sand** Brown, trace gravel, loose to very loose.							
6 / 2			SS	2	2,3,4,4	7			
11 / 3			SS	3	2,1,1,5	2			
12 / 4	404.90	End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 23, 2022 to termination at a depth of 3.6 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - dry

April 22, 2022 - dry

June 1, 2022 - dry

Drill Method: Hollow Stem Augers
Drill Date: February 23, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 306

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838305
E: 545271

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.85	Ground Surface							
0	0	412.60	**Topsoil** Approximately 250 millimetres of topsoil.	SS	1	2,2,4,5	6			
5	1		**Sand** Brown, trace gravel, loose.	SS	2	3,2,5,6	7			
10	3	409.40		SS	3	3,3,7,15	10			
15	4		**Clayey Sandy Silt Till** Brown, some gravel, very dense	SS	4	20,34,38,50/4	72			
16	5	407.70	End of Borehole							

NOTES:

1. Borehole was advanced using solid stem auger equipment on February 23, 2022 to termination at a depth of 5.2 metres.

2. Borehole was recorded as caved to a depth of 2.4 metres and dry upon completion and backfilled as per Ontario Regulation 903

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Moisture Content w% 10 20 30 40

Standard Penetration Test blows/300mm 20 40 60 80

Drill Method: Solid Stem Augers
Drill Date: February 23, 2022
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 307

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 3838296
E: 545199

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	411.12	Ground Surface							
0 / 0	410.87	**Topsoil** Approximately 250 millimetres of topsoil.							
		Clayey Sandy Silt Till Brown, some gravel, compact.	SS	1	1,2,2,3	4			
			SS	2	5,7,10,12	17			
			SS	3	9,10,15,19	25			
			SS	4	6,11,12,41	23			
16 / 5	405.90	End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on February 23, 2022 to termination at a depth of 5.2 metres.

2. Borehole was recorded as open and 'wet' at a depth of 4.3 metres below the existing grade upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: February 23, 2022
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

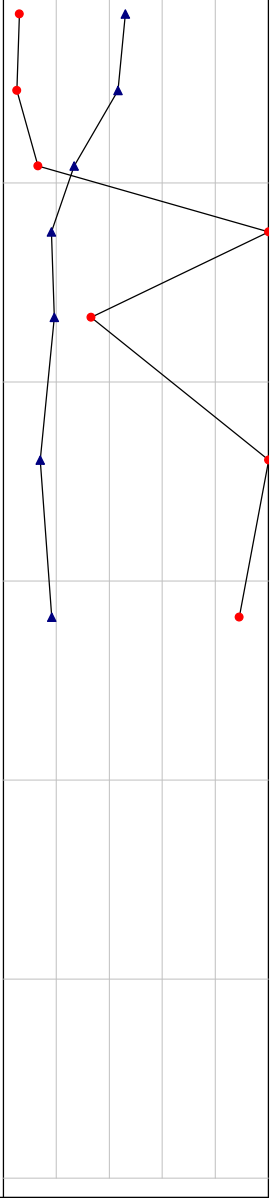
Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 401

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Rd, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4839146
E: 545881

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		420.91	Ground Surface							
0	0	420.66	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Silty Sand** Brown, trace to some gravel and clay, loose to compact.	SS	1	2,2,4,4	6			
2				SS	2	1,2,3,5	5			
3	1			SS	3	1,4,9,7	13			
4		419.10	**Clayey Sandy Silt Till** Brown, trace to some sand and gravel, compact to very dense	SS	4	6,15,50/4	100			
5				SS	5	6,17,16,24	33			
6	2			SS	6	10,35,50/5	100			
7										
8	3			SS	7	27,46,43, 50/3	89			
9		414.20	End of Borehole							
10	4									
11										
12										
13	5									
14										
15										
16	6									
17										
18										
19	7									
20										
21										
22	8									
23										
24										
25	9									
26										
27										
28	10									
29										
30										
31	11									
32										
33										
34	12									
35										
36										
37	13									
38										
39										



NOTES:

1. Borehole was advanced using solid stem auger equipment on April 18, 2022 to termination at a depth of 6.7 metres.

2. Borehole was recorded as open and 'wet' at a depth of 4.7 metres below the existing grade upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

April 22, 2022 - 2.29 metres below ground surface.

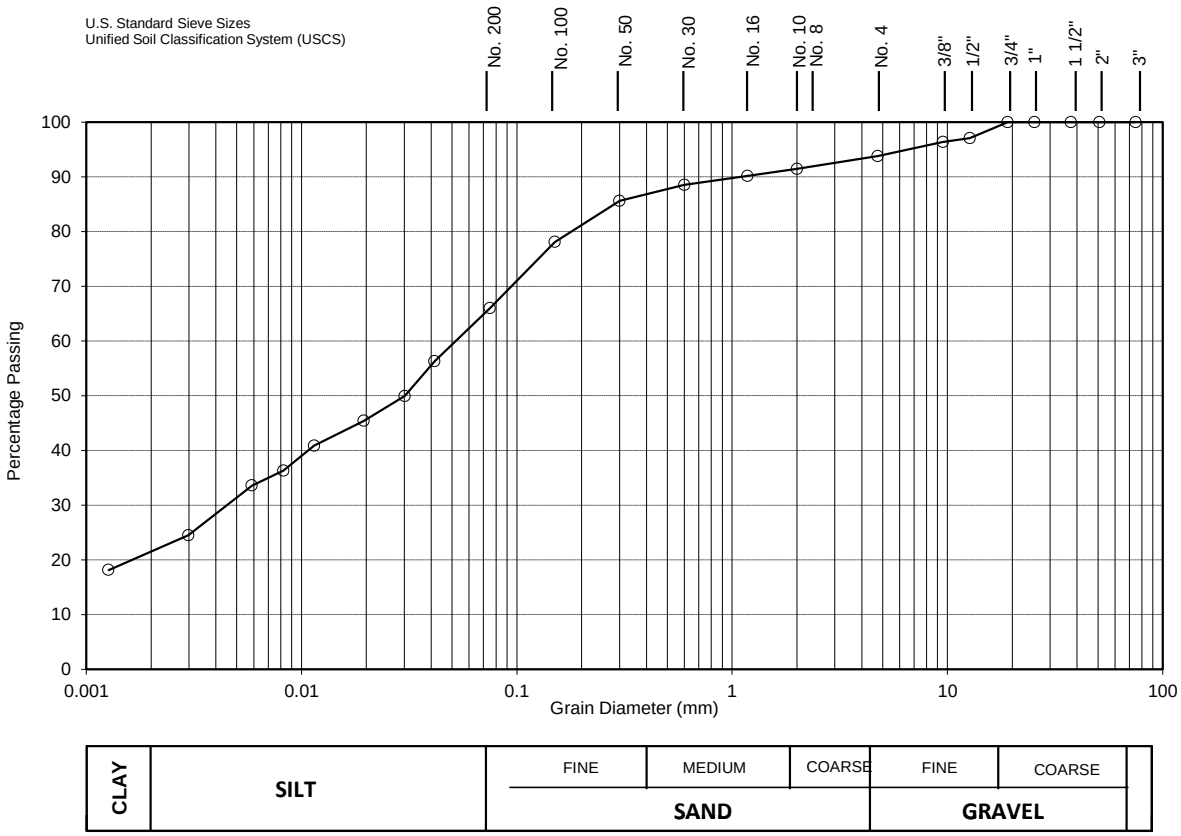
June 1, 2022 - 2.39 metres below ground surface.

Drill Method: Solid Stem Augers
Drill Date: April 18, 2022
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Mechanical & Hydrometer Analyses



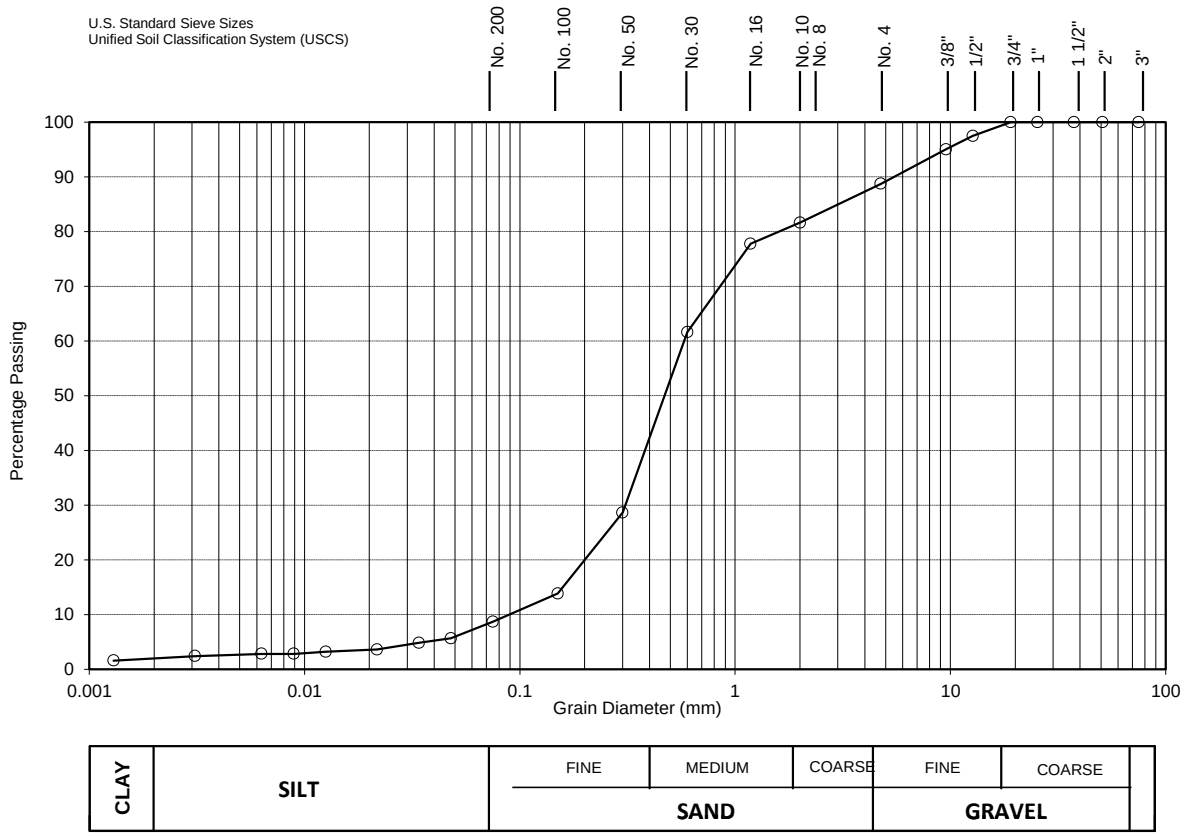
Lab No.:	**21-335**	Notes: Depth: 5'	
Borehole No.:	**003**		
Sample No.:	**3**		
CLAY [%]:	**22**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**44**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**28**		
GRAVEL [%]:	**6**	Estimated Infiltration Rate [mm/hr] : **< 10**	Estimated Permeability, k [cm/s] **10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0005**	Coefficient of Uniformity C_U: **102.0**	Coefficient of Curvature C_C: **0.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 1**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



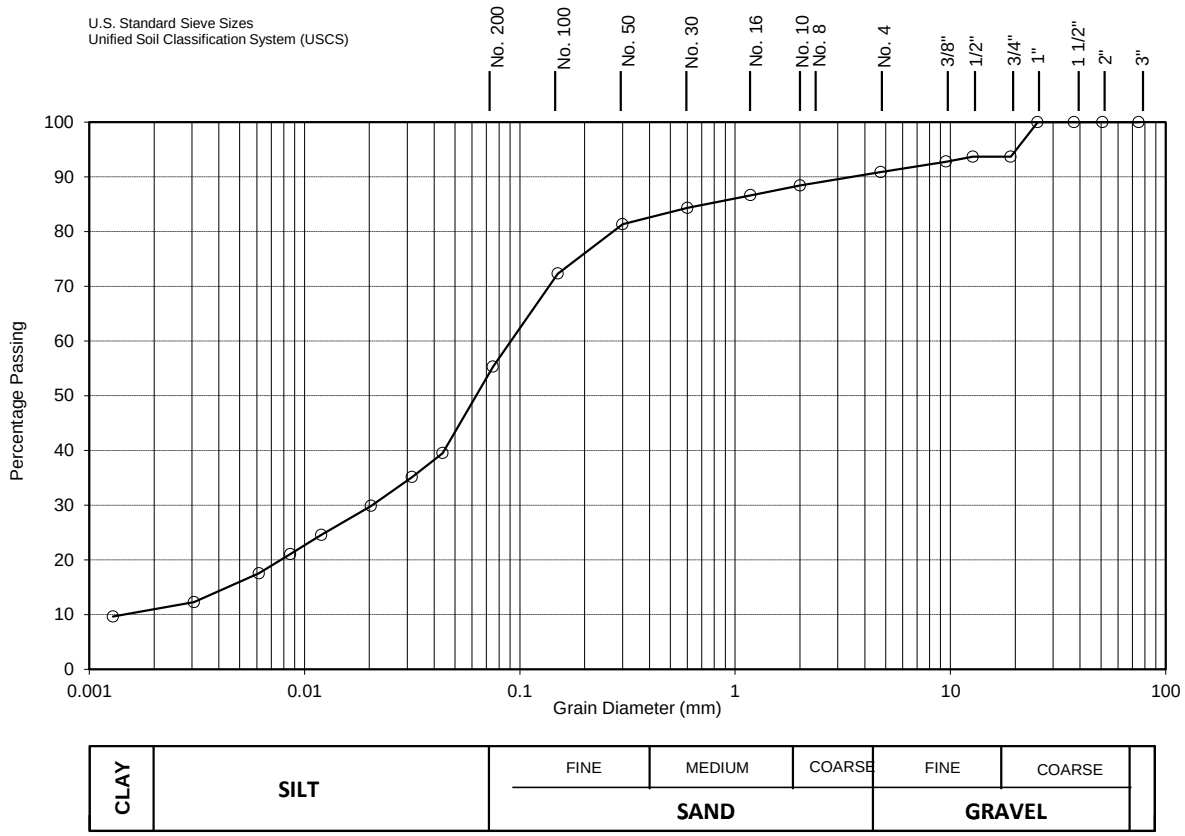
Lab No.:	**21-340**	Notes: Depth: 10'	
Borehole No.:	**004**		
Sample No.:	**5**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ some Gravel and traces of Silt and Clay**	
SILT [%]:	**7**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**80**		
GRAVEL [%]:	**11**	Estimated Infiltration Rate [mm/hr] : **150 to 300**	Estimated Permeability, k [cm/s] **10^{-2}**
D_{10} (Effective Diam. in mm):	**0.090**	Coefficient of Uniformity C_U: **6.6**	Coefficient of Curvature C_C: **1.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 2**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



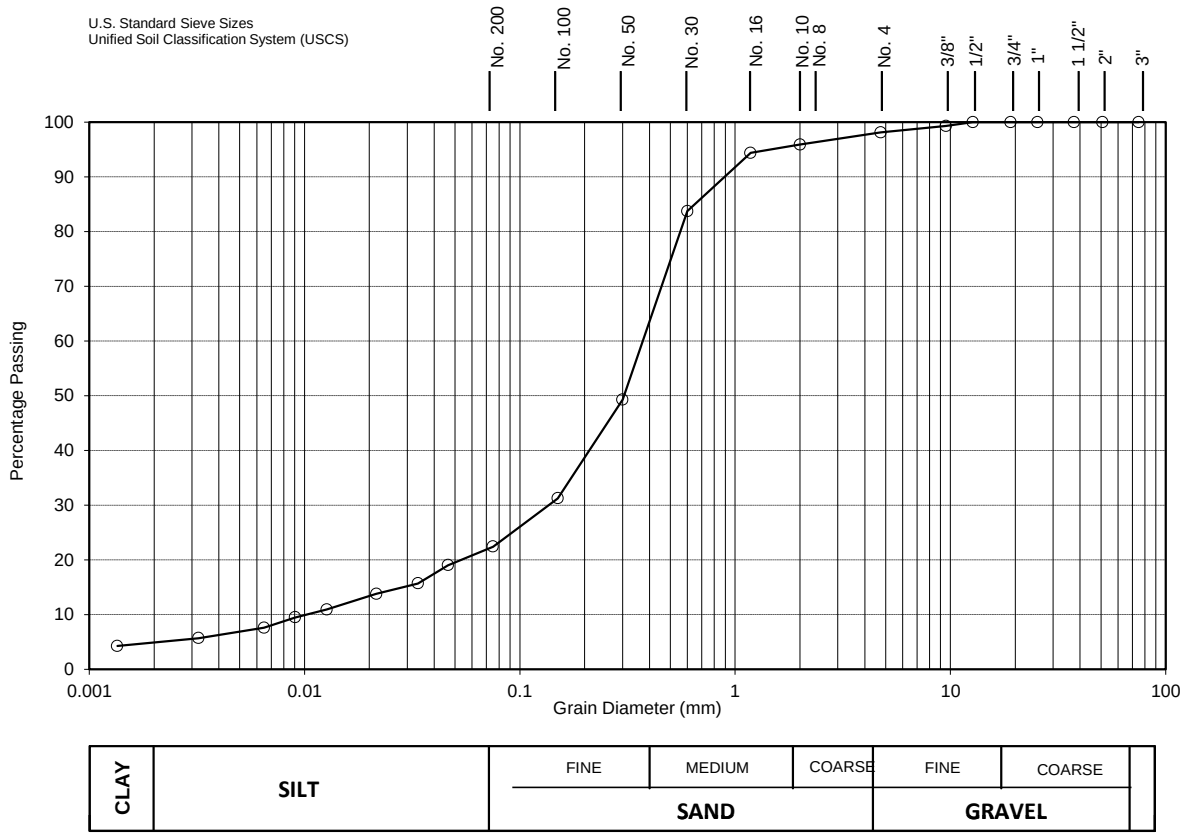
Lab No.:	**21-336**	Notes: Depth: 10'	
Borehole No.:	**006**		
Sample No.:	**5**		
CLAY [%]:	**11**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**44**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**36**		
GRAVEL [%]:	**9**	Estimated Infiltration Rate [mm/hr] : **10 to 15**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0015**	Coefficient of Uniformity C_U: **60.0**	Coefficient of Curvature C_C: **3.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 3**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



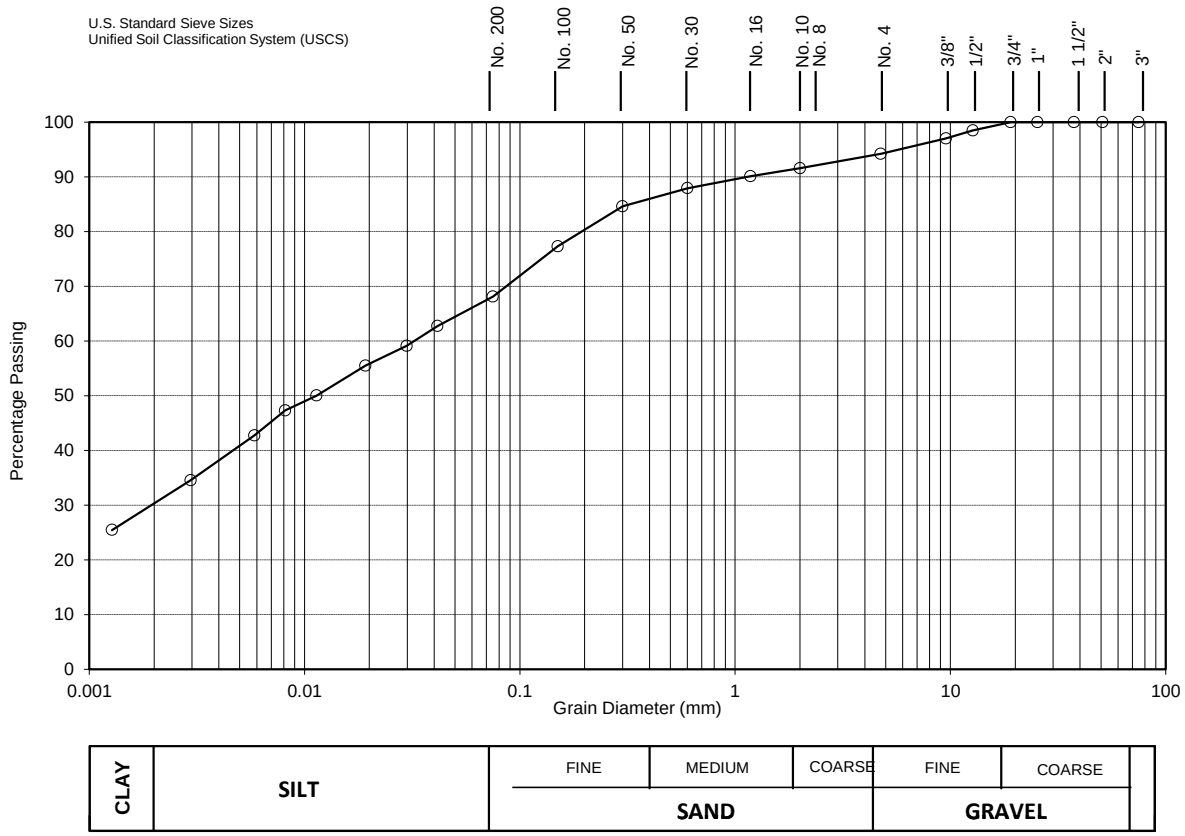
Lab No.:	**22-088**	Notes: Depth: 5'			
Borehole No.:	**201**				
Sample No.:	**2**				
CLAY [%]:	**5**	Soil Description:	**Brown Sand w/ Some Silt and traces of Clay and Gravel**		
SILT [%]:	**17**		**S.M. - Silty sands, sand-silt mixtures**		
SAND [%]:	**76**				
GRAVEL [%]:	**2**	Estimated Infiltration Rate [mm/hr] :	**50**	Estimated Permeability, k [cm/s]	**10^{-4}**
D_{10} (Effective Diam. in mm):	**0.0001**	Coefficient of Uniformity C_U:	**40.0**	Coefficient of Curvature C_C:	**5.4**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 4**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



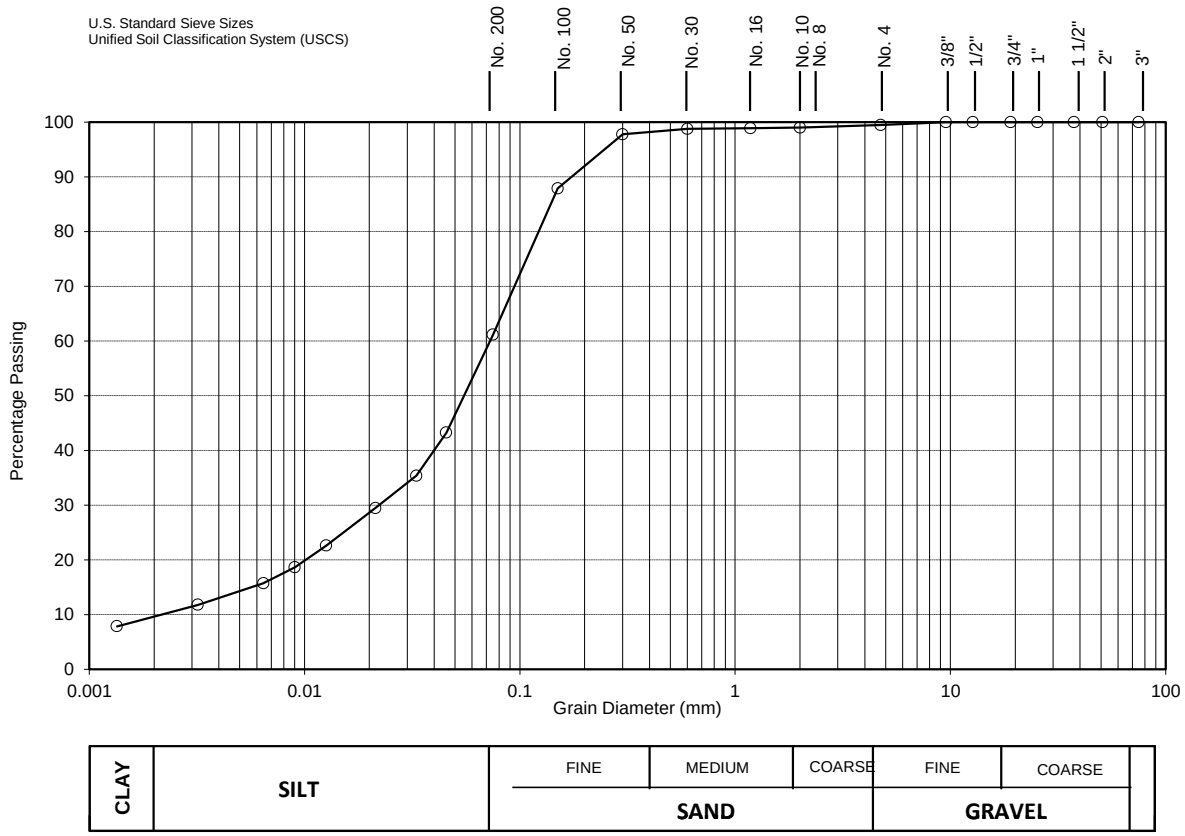
Lab No.:	**22-089**	Notes: Depth: 5'			
Borehole No.:	**202**				
Sample No.:	**2**				
CLAY [%]:	**30**	Soil Description:	**Brown Clayey Sandy Silt w/ a trace of Gravel**		
SILT [%]:	**38**		**M.L - Clayey silts with slight plasticity, silty or clayey fine sands,**		
SAND [%]:	**26**		**inorganic silts and very fine sands**		
GRAVEL [%]:	**6**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]	**10^{-8}**
D_{10} (Effective Diam. in mm):	**0.0004**	Coefficient of Uniformity C_U:	**80.0**	Coefficient of Curvature C_C:	**0.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 5**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



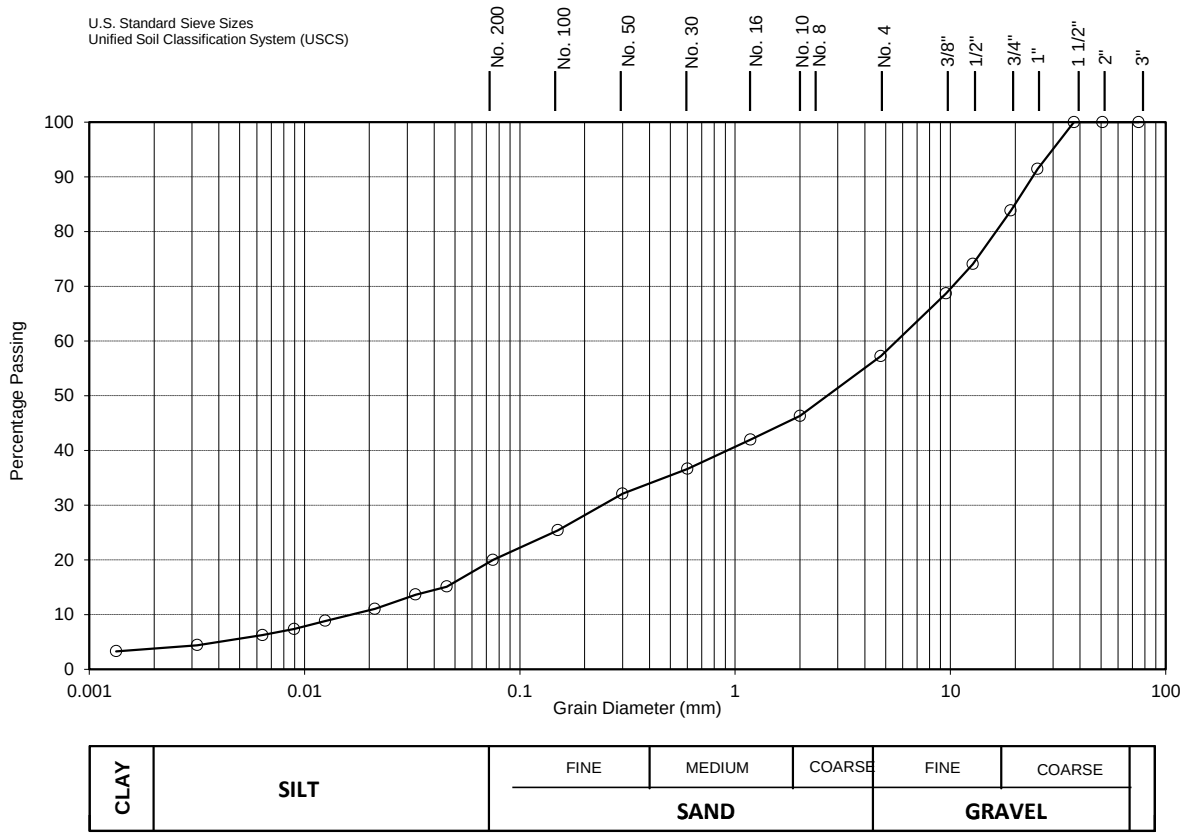
Lab No.:	**22-090**	Notes: Depth: 20'	
Borehole No.:	**202**		
Sample No.:	**5**		
CLAY [%]:	**10**	Soil Description: **Light Brown Silt and Sand w/ some Clay**	
SILT [%]:	**51**	**M.L. - Inorganic silts and very fine sands**	
SAND [%]:	**39**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] : **10 to 15**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0022**	Coefficient of Uniformity C_U: **33.2**	Coefficient of Curvature C_C: **3.0**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 6**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



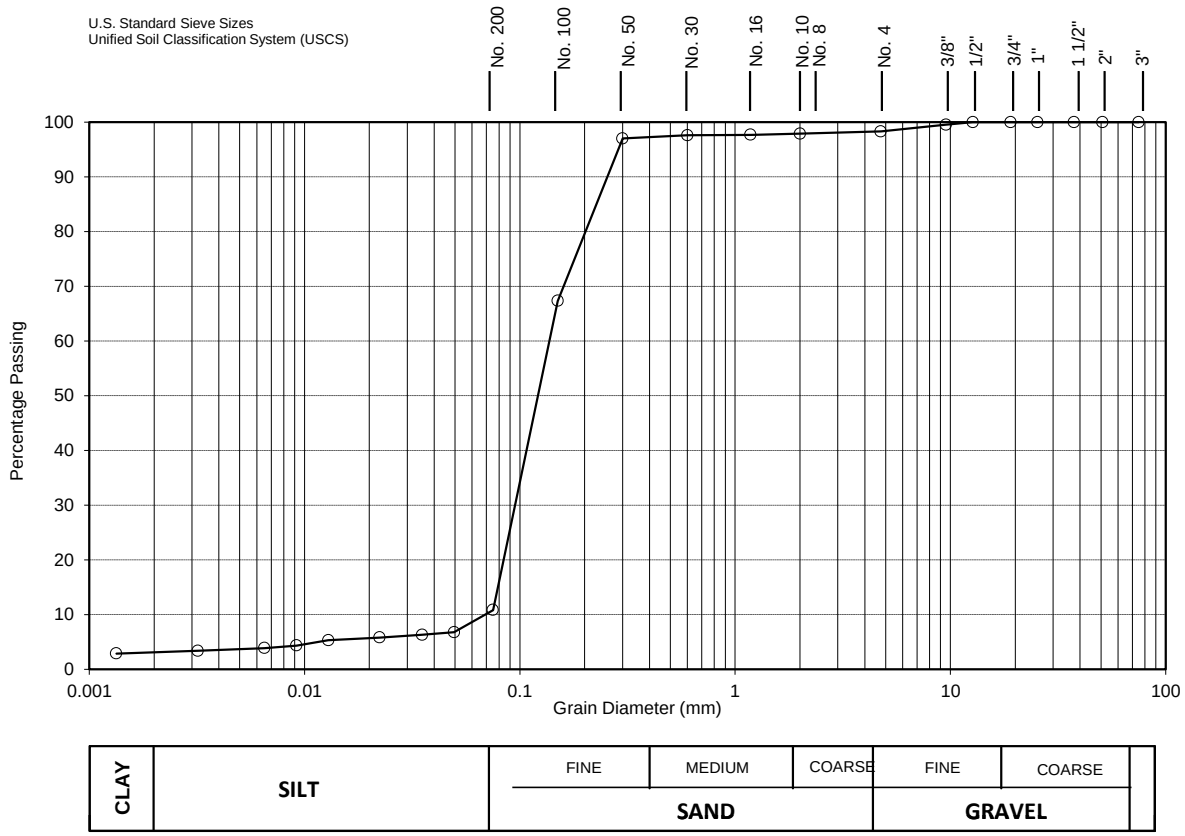
Lab No.:	**22-091**	Notes: Depth: 5'	
Borehole No.:	**203**		
Sample No.:	**2**		
CLAY [%]:	**3**	Soil Description:	**Brown Gravel and Sand w/ some Silt and a trace of Clay**
SILT [%]:	**17**		**G.M. - Gravel-sand-silt mixtures, silty gravels**
SAND [%]:	**37**		
GRAVEL [%]:	**43**	Estimated Infiltration Rate [mm/hr] : **50 to 60**	Estimated Permeability, k [cm/s] **10^{-4}**
D_{10} (Effective Diam. in mm):	**0.017**	Coefficient of Uniformity C_U: **335.3**	Coefficient of Curvature C_C: **0.6**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 7**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



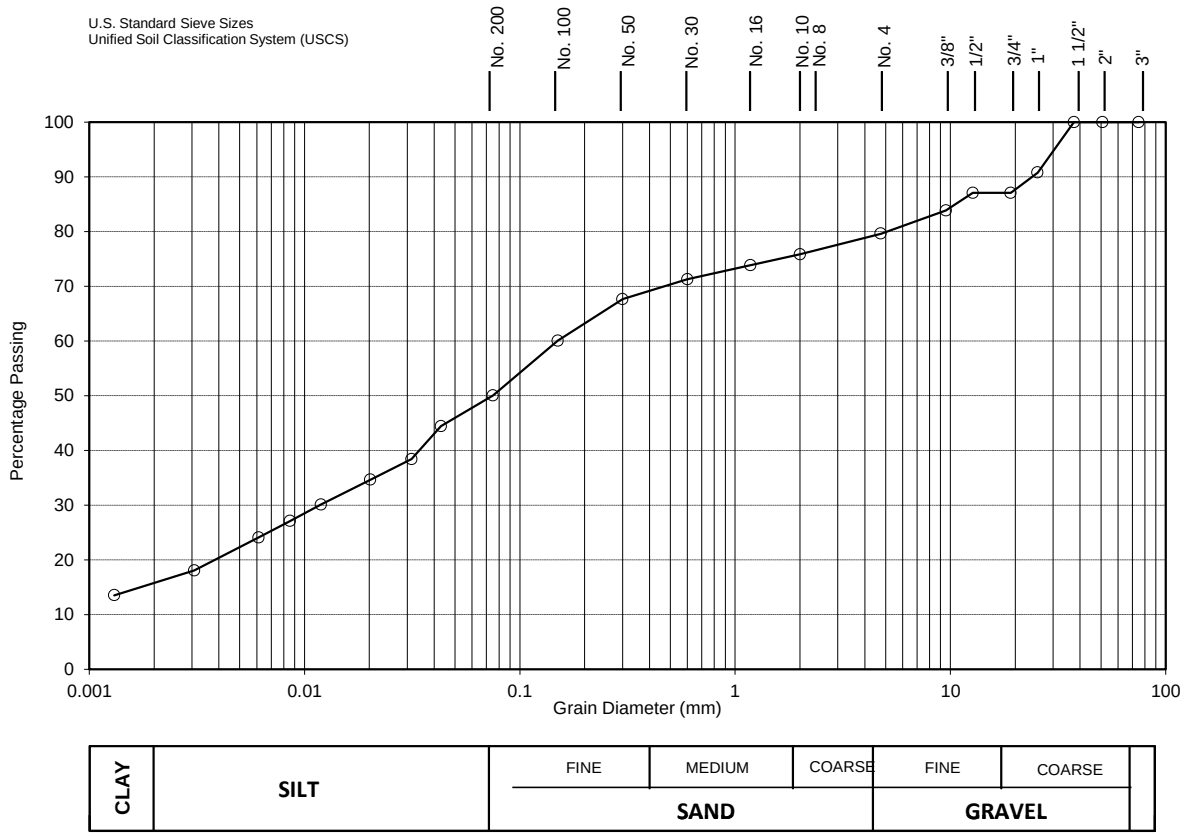
Lab No.:	**22-092**	Notes: Depth: 20'	
Borehole No.:	**203**		
Sample No.:	**5**		
CLAY [%]:	**3**	Soil Description: **Brown Sand w/ traces of Silt, Clay and Gravel**	
SILT [%]:	**8**	**S.P. - Poorly graded sands**	
SAND [%]:	**87**		
GRAVEL [%]:	**2**	Estimated Infiltration Rate [mm/hr] : **125 to 150**	Estimated Permeability, k [cm/s] **10^{-3}**
D_{10} (Effective Diam. in mm):	**0.07**	Coefficient of Uniformity C_U: **2.1**	Coefficient of Curvature C_C: **0.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 8**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



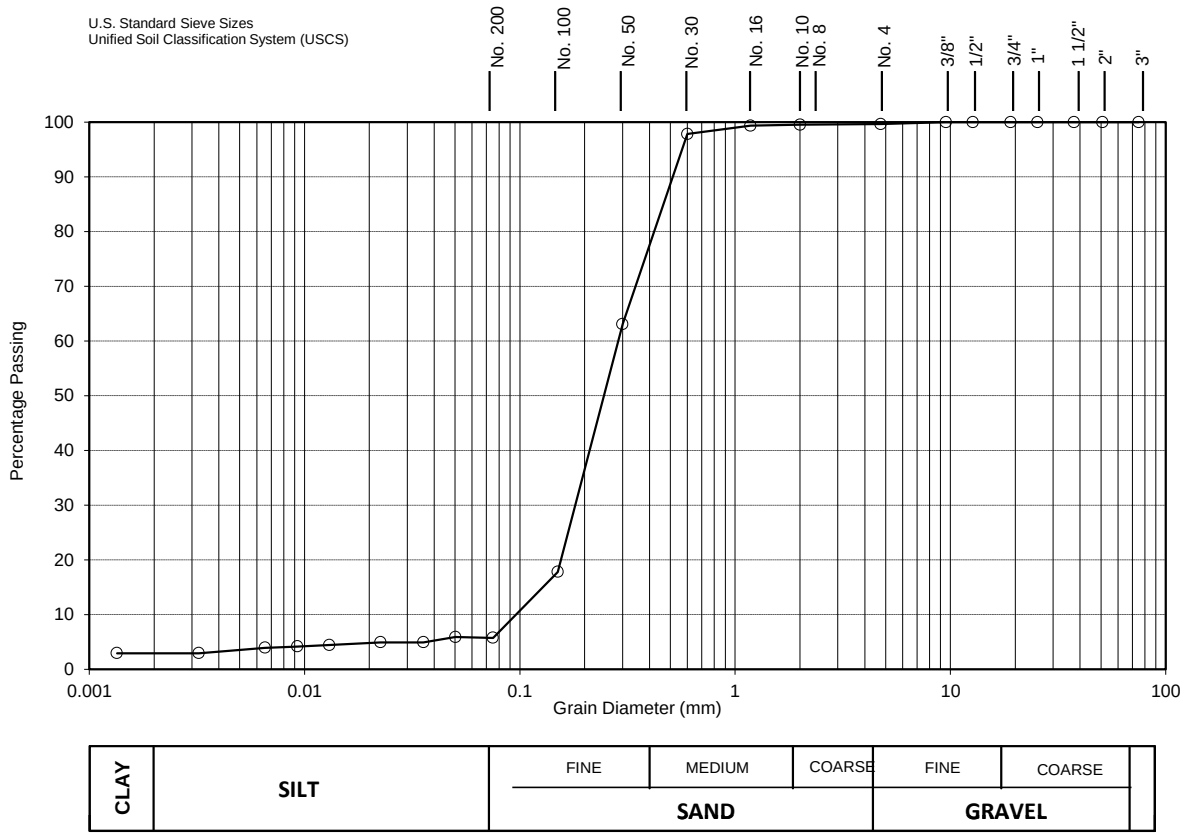
Lab No.:	**22-094**	Notes: Depth: 5'	
Borehole No.:	**204**		
Sample No.:	**2**		
CLAY [%]:	**16**	Soil Description: **Brown Sandy Gravelly Silt w/ some Clay**	
SILT [%]:	**34**	**M.L. - Silty or clayey fine sands**	
SAND [%]:	**30**		
GRAVEL [%]:	**20**	Estimated Infiltration Rate [mm/hr] : **10**	Estimated Permeability, k [cm/s] **10^{-7}**
D_{10} (Effective Diam. in mm):	**0.00085**	Coefficient of Uniformity C_U: **188.2**	Coefficient of Curvature C_C: **1.2**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 9**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



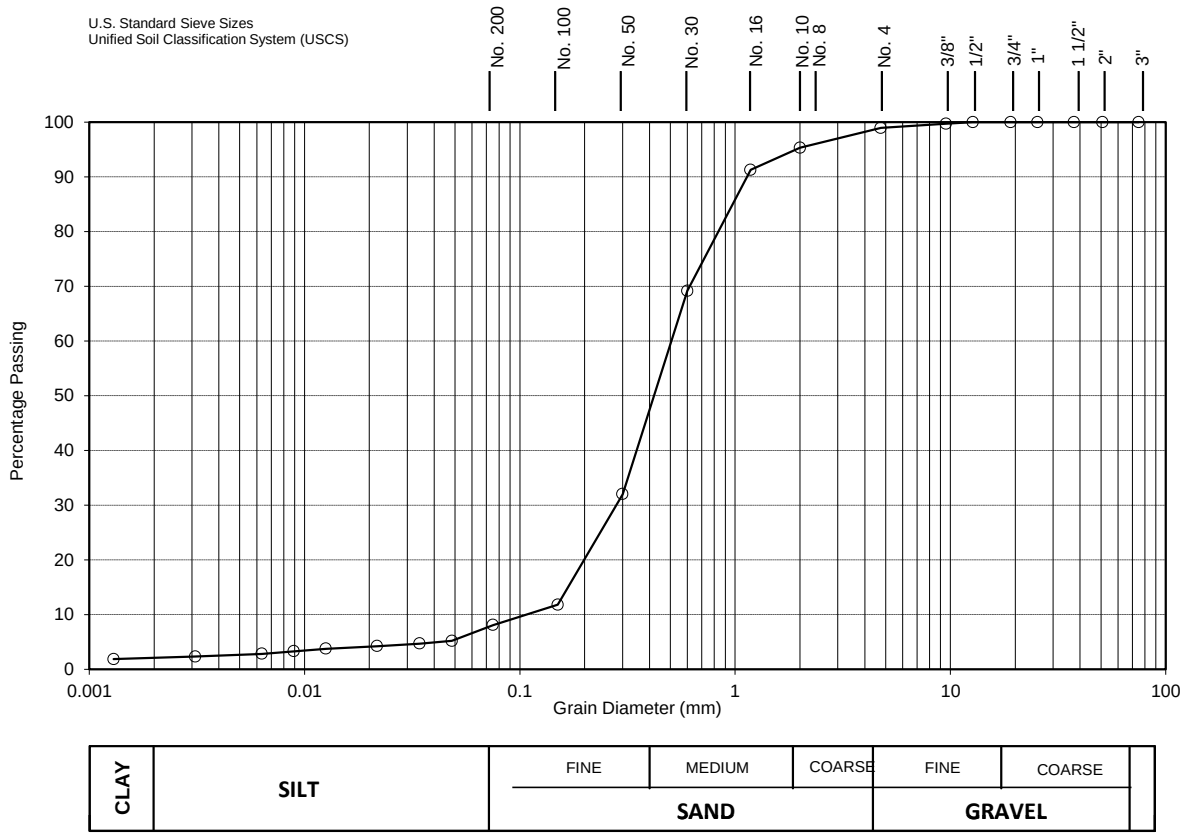
Lab No.:	**22-093**	Notes: Depth: 10'	
Borehole No.:	**205**		
Sample No.:	**3**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ traces of Silt and Clay**	
SILT [%]:	**4**	**S.P. - Poorly graded sands**	
SAND [%]:	**94**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] : **150 to 300**	Estimated Permeability, k [cm/s] **10^{-3}**
D_{10} (Effective Diam. in mm):	**0.095**	Coefficient of Uniformity C_U: **3.1**	Coefficient of Curvature C_C: **1.2**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 10**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



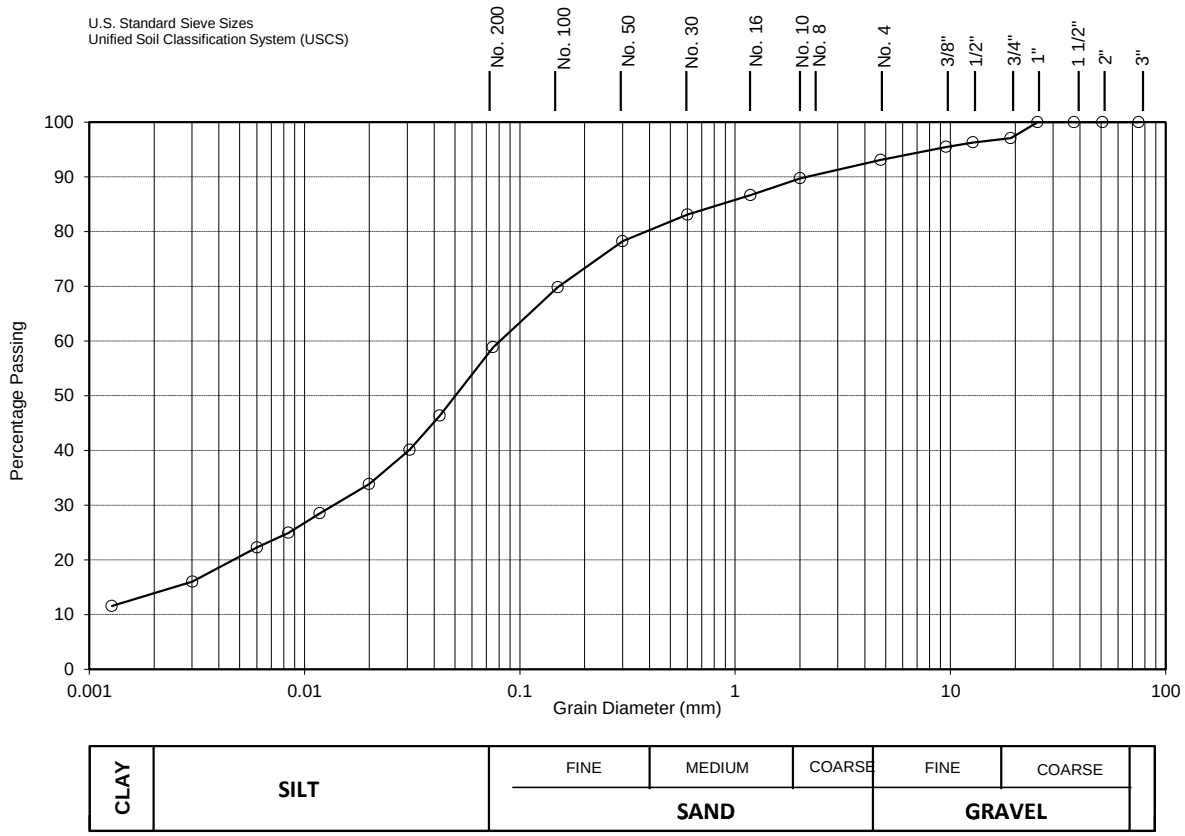
Lab No.:	**21-339**	Notes: Depth: 15'	
Borehole No.:	**102**		
Sample No.:	**6**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ traces of Silt, Clay and Gravel**	
SILT [%]:	**6**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**91**		
GRAVEL [%]:	**1**	Estimated Infiltration Rate [mm/hr] : **150 to 300**	Estimated Permeability, k [cm/s] **10^{-2}**
D_{10} (Effective Diam. in mm):	**0.10**	Coefficient of Uniformity C_U: **5.1**	Coefficient of Curvature C_C: **1.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 11**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



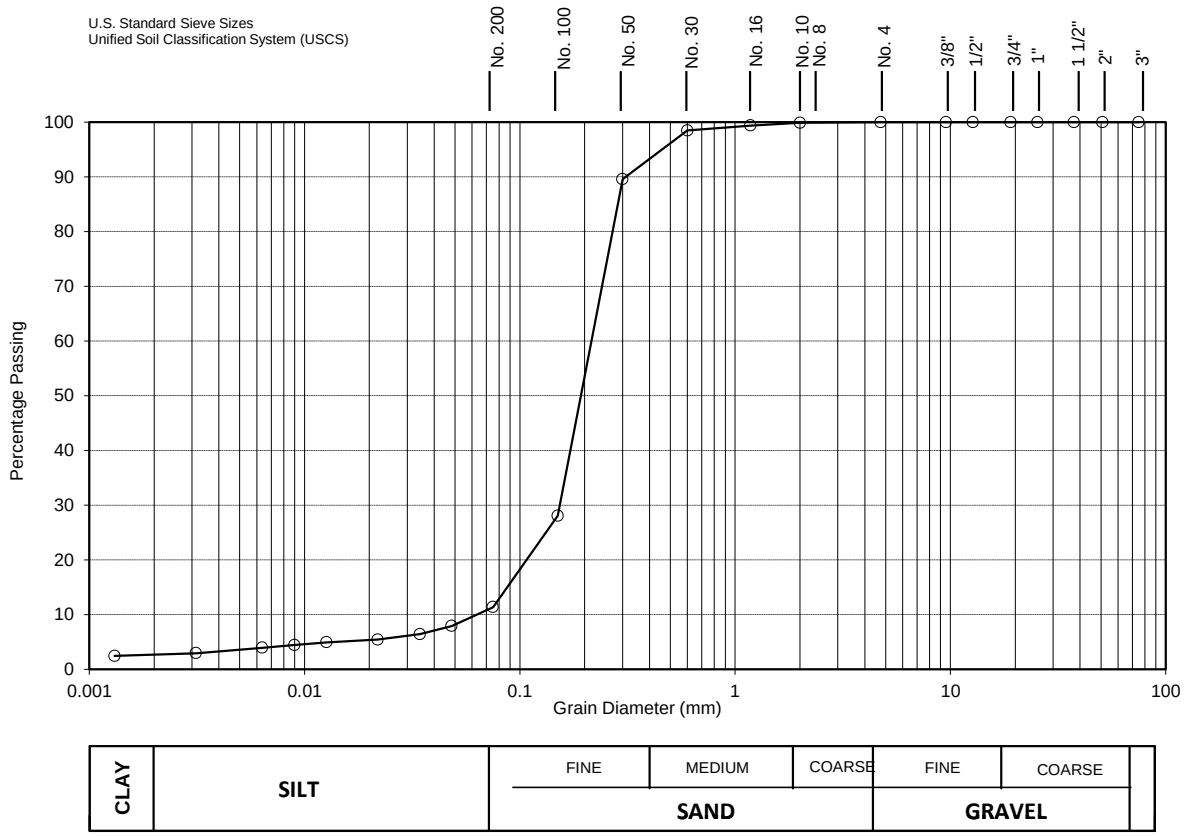
Lab No.:	**21-338**	Notes: Depth: 5'	
Borehole No.:	**103**		
Sample No.:	**3**		
CLAY [%]:	**14**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**45**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**34**		
GRAVEL [%]:	**7**	Estimated Infiltration Rate [mm/hr] : **10**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.00100**	Coefficient of Uniformity C_U: **80.0**	Coefficient of Curvature C_C: **2.1**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 12**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



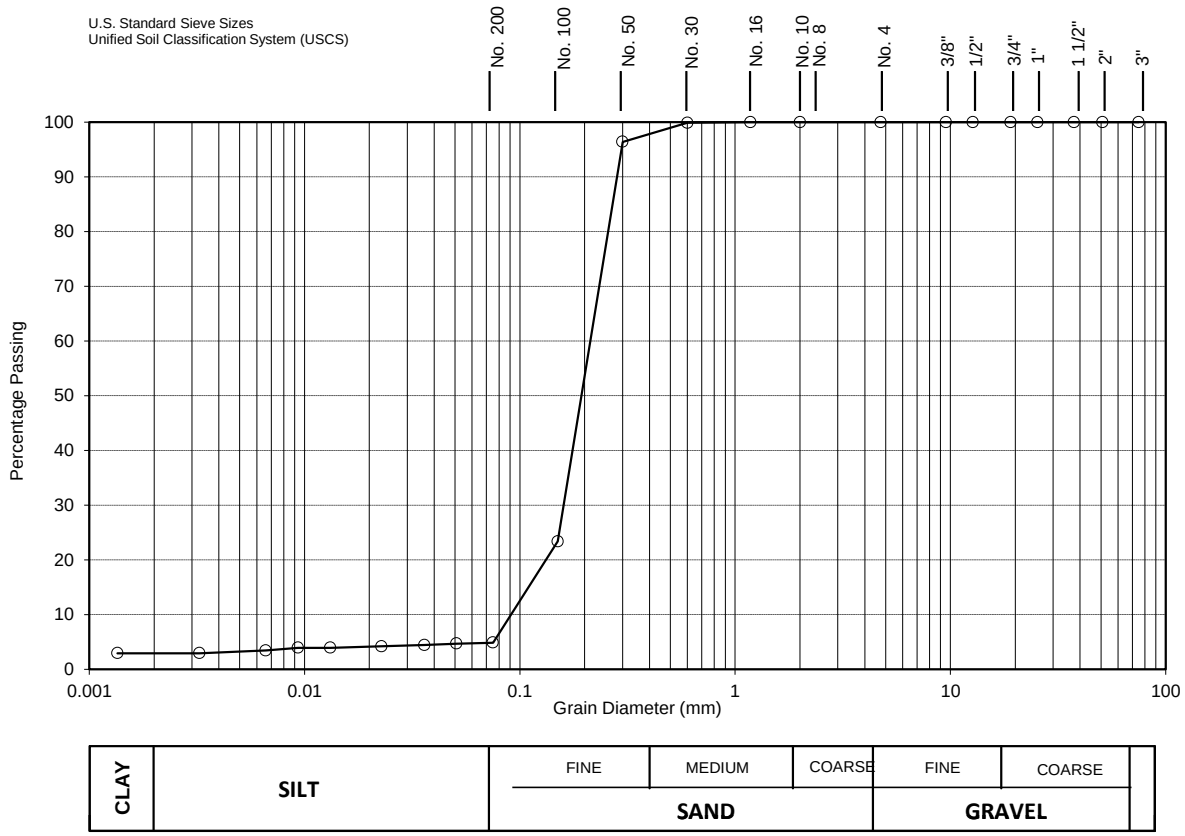
Lab No.:	**21-337**	Notes: Depth: 7.5'	
Borehole No.:	**104**		
Sample No.:	**4**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ traces of Silt and Clay**	
SILT [%]:	**9**	**S.P. - Poorly graded sands, little or no fines**	
SAND [%]:	**89**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] : **100 to 150**	Estimated Permeability, k [cm/s] **10^{-3} to 10^{-2}**
D_{10} (Effective Diam. in mm):	**0.0600**	Coefficient of Uniformity C_U: **3.7**	Coefficient of Curvature C_C: **1.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 13**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



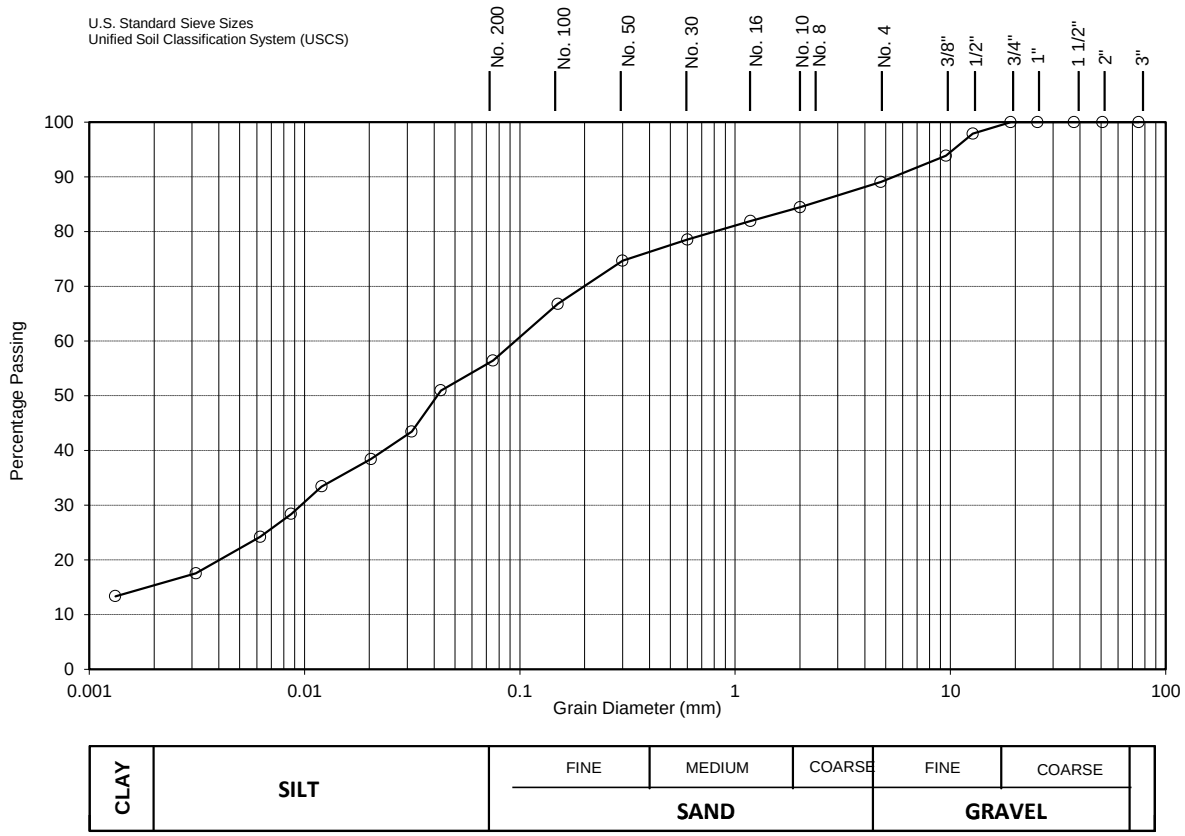
Lab No.:	**22-096**	Notes: Depth: 5'	
Borehole No.:	**302**		
Sample No.:	**2**		
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ traces of Silt and Clay**
SILT [%]:	**3**		**S.P. - Poorly graded sands, little or no fines**
SAND [%]:	**95**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] :	**150 to 300**
D_{10} (Effective Diam. in mm):	**0.09**	Coefficient of Uniformity C_U:	**2.3**
		Estimated Permeability, k [cm/s]	**10^{-2}**
		Coefficient of Curvature C_C:	**1.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

March 2022	**Grain Size Analysis No. 14**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



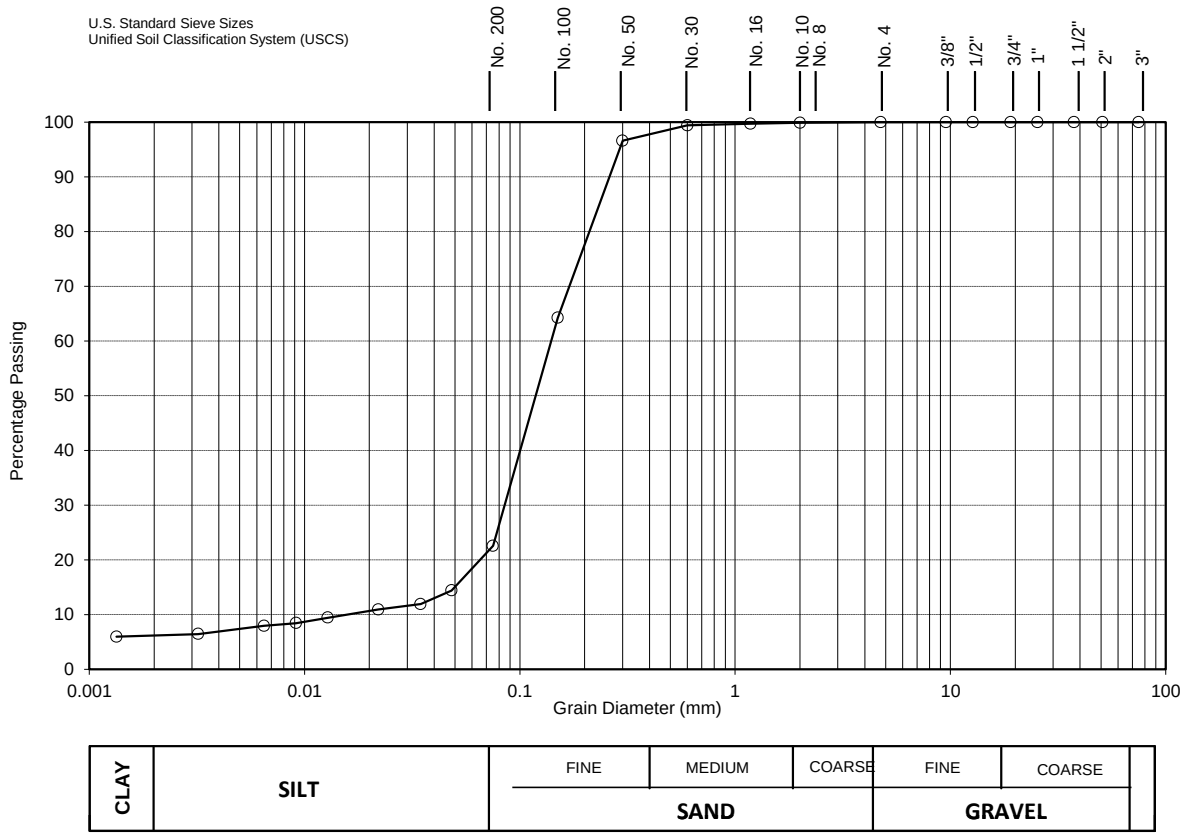
Lab No.:	**22-097**	Notes: Depth: 5'			
Borehole No.:	**304**				
Sample No.:	**2**				
CLAY [%]:	**16**	Soil Description: **Brown Sandy Silt w/ some Clay and Gravel**			
SILT [%]:	**40**	**M.L. - Inorganic silts and very fine sands, silty or clayey fine sands, clayey silts with slight plasticity to S.M. - Sand-silt mixtures**			
SAND [%]:	**33**				
GRAVEL [%]:	**11**	Estimated Infiltration Rate [mm/hr] :	**10**	Estimated Permeability, k [cm/s]	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0009**	Coefficient of Uniformity C_U:	**103.3**	Coefficient of Curvature C_C:	**1.1**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

March 2022	**Grain Size Analysis No. 15**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



Lab No.:	**22-098**	Notes: Depth: 5'	
Borehole No.:	**305**		
Sample No.:	**2**		
CLAY [%]:	**7**	Soil Description: **Brown Sand w/ some Silt and a trace of Clay**	
SILT [%]:	**16**	**S.M. - Sand-silt mixtures, silty sands**	
SAND [%]:	**77**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] : **50 to 60**	Estimated Permeability, k [cm/s] **10^{-4}**
D_{10} (Effective Diam. in mm):	**0.015**	Coefficient of Uniformity C_U: **10.0**	Coefficient of Curvature C_C: **3.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

March 2022	**Grain Size Analysis No. 16**	**Project No.: SM 301951-T**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

401 Grays Road · Hamilton, ON · L8E 2Z3

www.soil-mat.ca info@soil-mat.ca 905.318.7440 / 800.243.1922 (*toll free*) 905.318.7455

PROJECT NO.: SM 301951-G August 19, 2024

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Hatim Jafferjee
Land Development Coordinator

SUPPLEMENTAL GROUNDWATER DATA
PROPOSED RESIDENTIAL DEVELOPMENT
CLAYTON AND ELORA SANDS
ELORA, ONTARIO

Dear Mr. Jafferjee,

Further to the recent request and correspondence with MTE Consultants, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has prepared the following brief updated groundwater level summary based on information collected between July 15, 2022 to May 3, 2023. This information is further to our preliminary hydrogeological assessment reports for the development lands [SM 301951-G, dated June 17 and July 20, 2022], and should be referenced in conjunction with those reports.

Groundwater Observations

Monitoring wells were installed at Borehole Nos. 004, 101, 102, 104, 201, 201A, 202, 203, 204, 205, 206, 301 through 305, and 401, to allow for future measurements of the static groundwater level. Monitoring data up to June 2022 was presented in the prior referenced reports. A data logger was maintained in each of the monitoring wells to allow for further continuous monitoring of the groundwater level between July 2022 to May 2023, the readings of which have been illustrated in graphs which can be found appended to the end of this report.

In addition, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on various dates, ranging from August 2021 to May 2023. These have been summarized in the following charts. As well, the detailed plots of continuous groundwater levels for each monitoring well are appended.

TABLE A
SUMMARY OF MANUAL GROUNDWATER READINGS (ELORA SANDS)

Borehole No. 004 (Ground Surface Elevation of 405.55 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	2.74	402.8
August 27, 2021	1.75	403.8
February 23, 2022	1.33	404.2
April 22, 2022	1.47	404.1
June 1, 2022	1.78	403.8
May 3, 2023	1.20	404.35

Borehole No. 201 (Ground Surface Elevation of 404.80 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.69	402.1
April 22, 2022	1.88	402.9
June 1, 2022	2.44	402.4
May 3, 2023	1.88	402.9

Borehole No. 201A (Ground Surface Elevation of 404.75 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.8
April 22, 2022	2.05	402.7
June 1, 2022	2.43	402.3
May 3, 2023	1.71	403.1

Borehole No. 202 (Ground Surface Elevation of 406.59 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	5.5	401.1
April 22, 2022	4.76	401.8
June 1, 2022	5.43	401.2
May 3, 2023	4.51	402.1

Borehole No. 203 (Ground Surface Elevation of 407.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.0
April 22, 2022	5.90	401.2
June 1, 2022	5.91	401.2
May 3, 2023	Dry	<401.0

Borehole No. 204 (Ground Surface Elevation of 409.56 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.81	406.7
April 22, 2022	1.16	408.4
June 1, 2022	1.53	408.0
May 3, 2023	1.20	408.4

Borehole No. 205 (Ground Surface Elevation of 412.99 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.56	410.4
April 22, 2022	2.25	410.7
June 1, 2022	2.39	410.6
May 3, 2023	2.34	410.6

Borehole No. 206 (Ground Surface Elevation of 412.88 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	6.83	406.1
April 22, 2022	4.60	408.3
June 1, 2022	4.66	408.2
May 3, 2023	4.76	408.1

Borehole No. 401 (Ground Surface Elevation of 420.91 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
April 22, 2022	2.29	418.6
June 1, 2022	2.39	418.5
May 3, 2023	2.31	418.6

TABLE B
SUMMARY OF MANUAL GROUNDWATER READINGS (CLAYTON LANDS)

Borehole No. 101 (Ground Surface Elevation of 408.60 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	4.78	403.8
August 27, 2021	4.71	403.9
October 14, 2021	4.33	404.3
February 23, 2022	4.31	404.3
April 22, 2022	4.07	404.5
June 1, 2022	4.15	404.5
May 3, 2023	4.06	404.5

Borehole No. 102 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	3.58	410.6
August 27, 2021	3.61	410.5
October 14, 2021	3.62	410.5
February 23, 2022	3.50	410.6
April 22, 2022	2.89	411.2
June 1, 2022	3.05	411.1
May 3, 2023	3.00	411.0

Borehole No. 103 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	6.78	407.3
August 27, 2021	6.96	407.2
October 14, 2021	7.09	407.0
February 23, 2022	6.83	407.3
April 22, 2022	6.13	408.0
June 1, 2022	6.28	407.8
May 3, 2023	6.56	407.6

Borehole No. 301 (Ground Surface Elevation of 412.75 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.29	406.5
April 22, 2022	5.65	407.1
June 1, 2022	5.71	407.0
May 3, 2023	5.85	406.9

Borehole No. 302 (Ground Surface Elevation of 413.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.62	406.4
April 22, 2022	6.06	406.9
June 1, 2022	6.12	406.9
May 3, 2023	6.35	406.7

Borehole No. 303 (Ground Surface Elevation of 414.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	5.40	408.6
April 22, 2022	6.04	407.9
June 1, 2022	6.11	407.9
May 3, 2023	6.41	407.6

Borehole No. 304 (Ground Surface Elevation of 407.90 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	2.87	405.0
April 22, 2022	2.60	405.3
June 1, 2022	2.96	404.9
May 3, 2023	2.42	4055

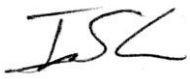
Borehole No. 305 (Ground Surface Elevation of 408.60 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	Dry	<405.6
April 22, 2022	Dry	<405.6
June 1, 2022	Dry	<405.6
May 3, 2023	Dry	<405.6

*Ground surface elevations have been interpolated based on contours from current topographic survey

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Kevin Reid, B. Eng
Junior Engineer



Ian Shaw, P. Eng., QP_{ESA}
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Groundwater Monitoring Well Plots

Distribution: Cachet Developments [pdf]

LEGEND

- Borehole Location — BH#
- Monitoring Well Location — MW#
- Geological Cross Section Location

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301591-G.

2. Borehole and monitoring well locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Nichol Road 15
Elora, Ontario

Borehole Location Plan

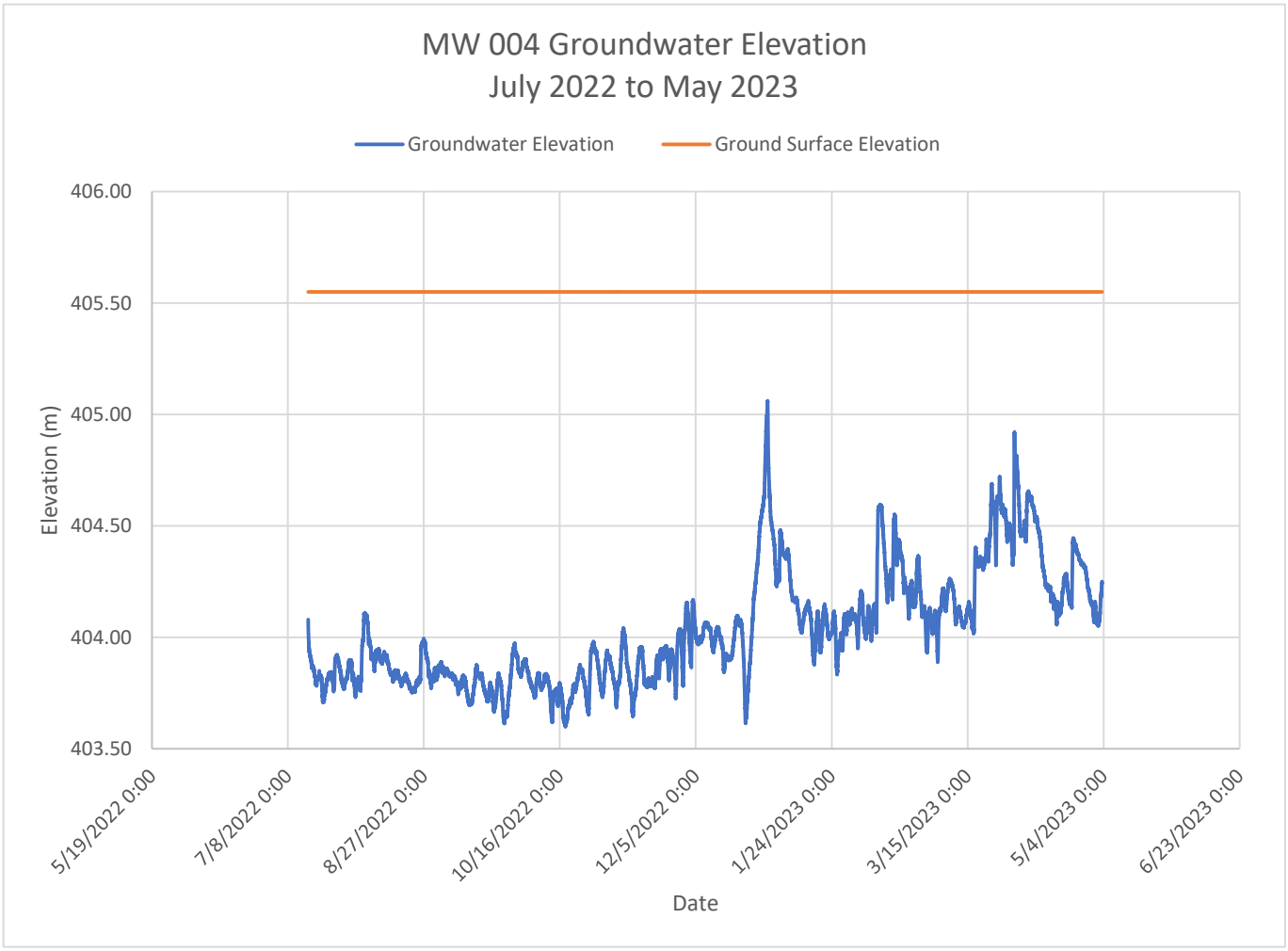
Project No. SM 301591-G

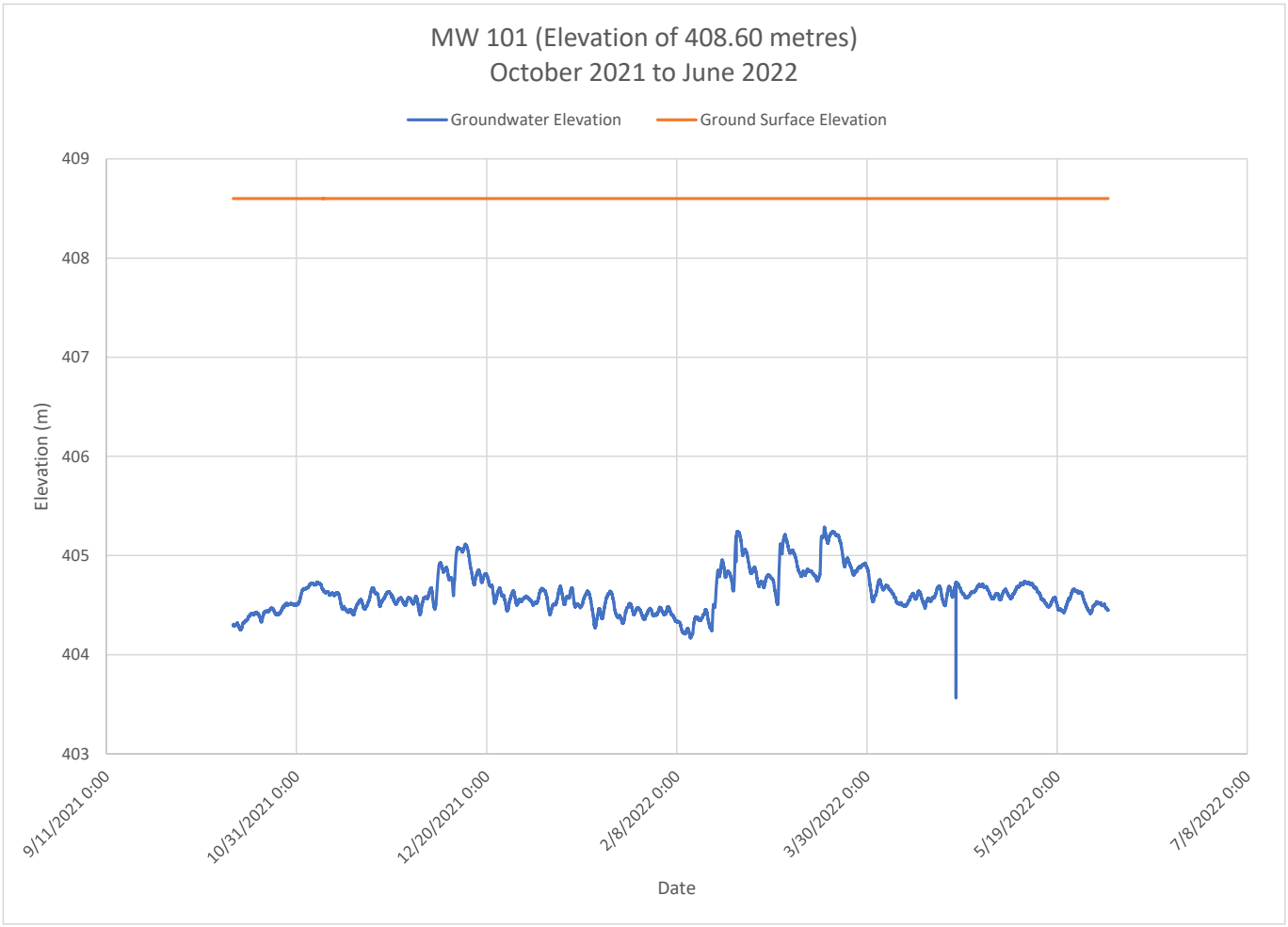
Date: June 2022

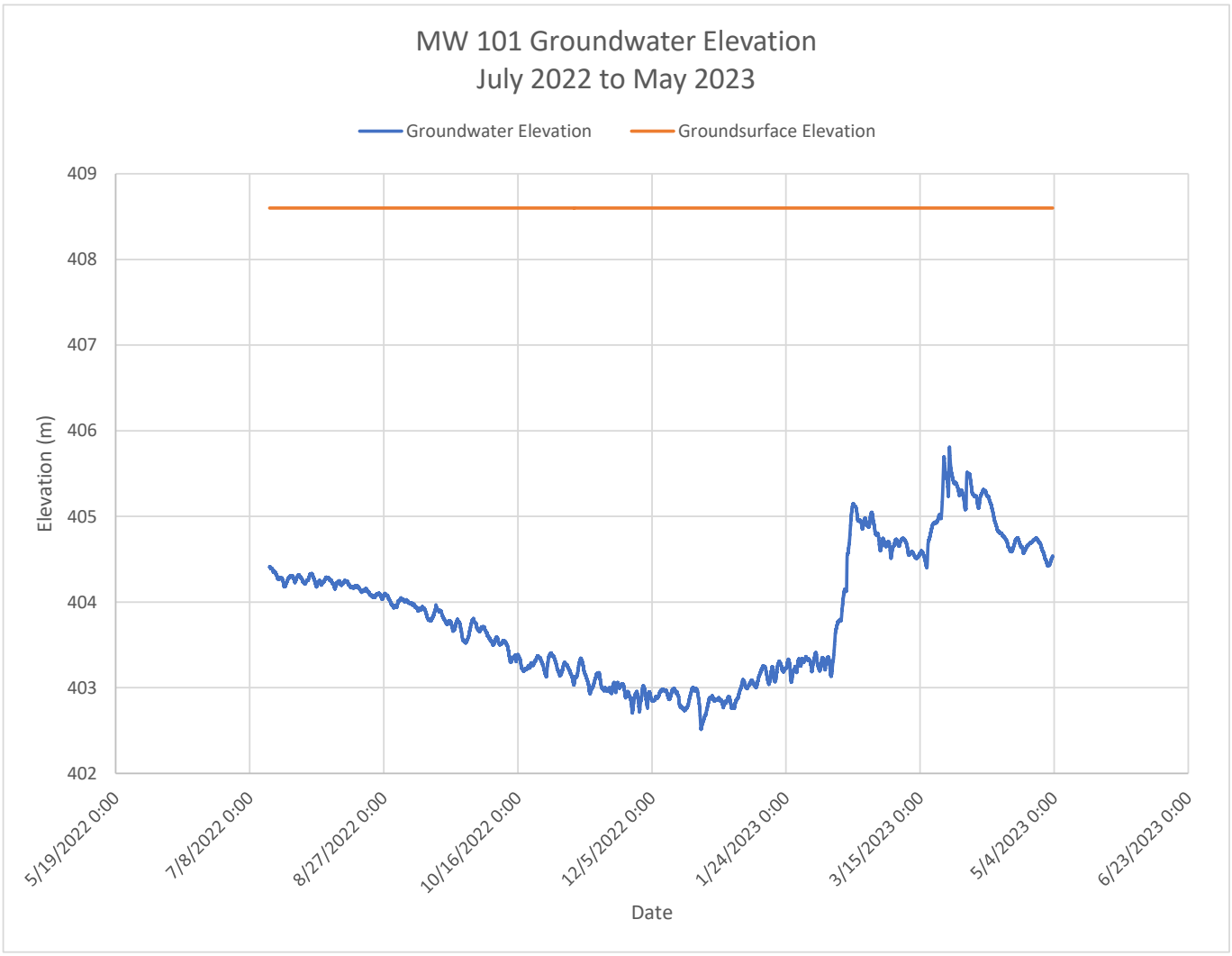
Drawn: SW | Checked: IS

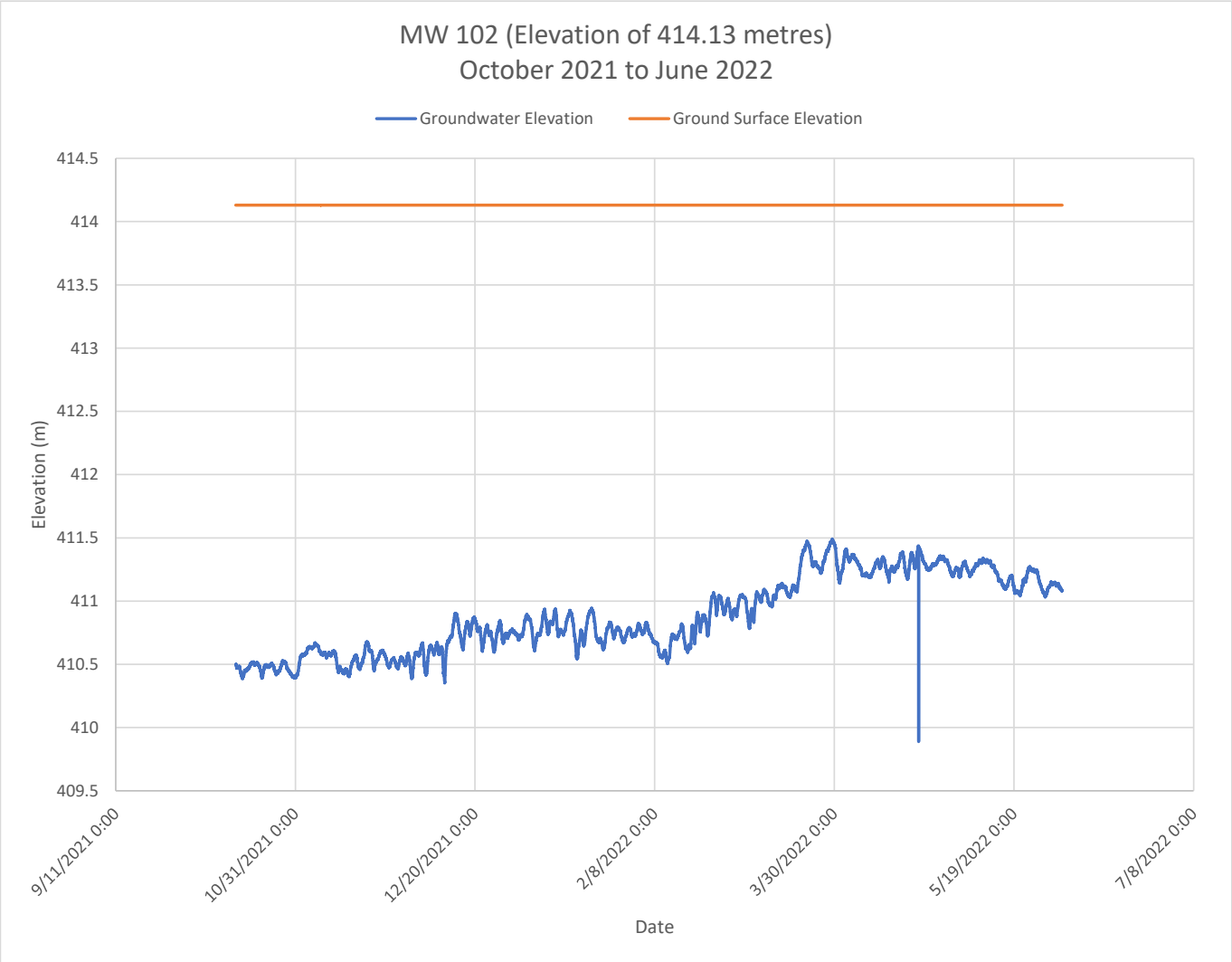
SM 301591-G Borehole Location Plan

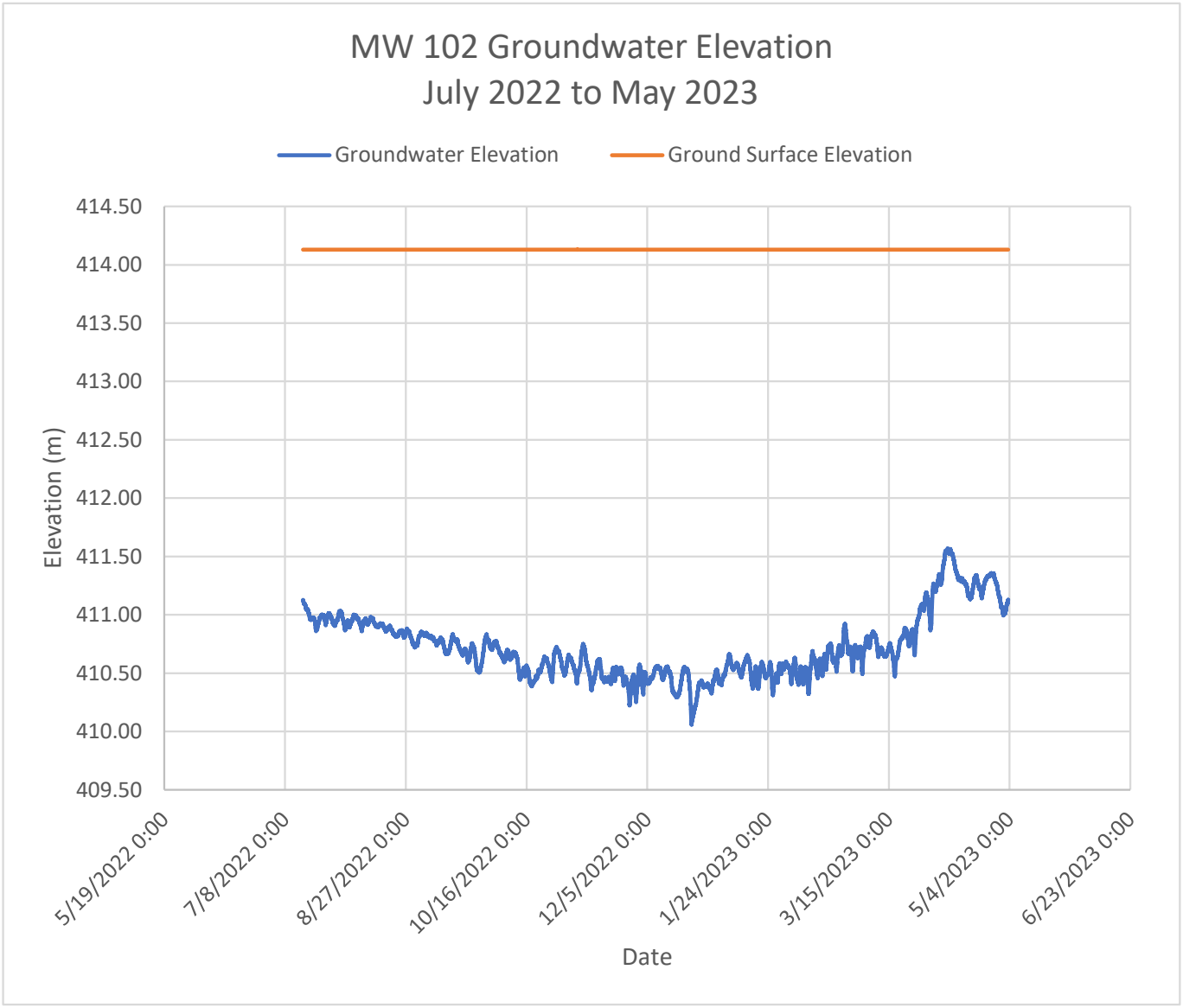
Drawing No. 1

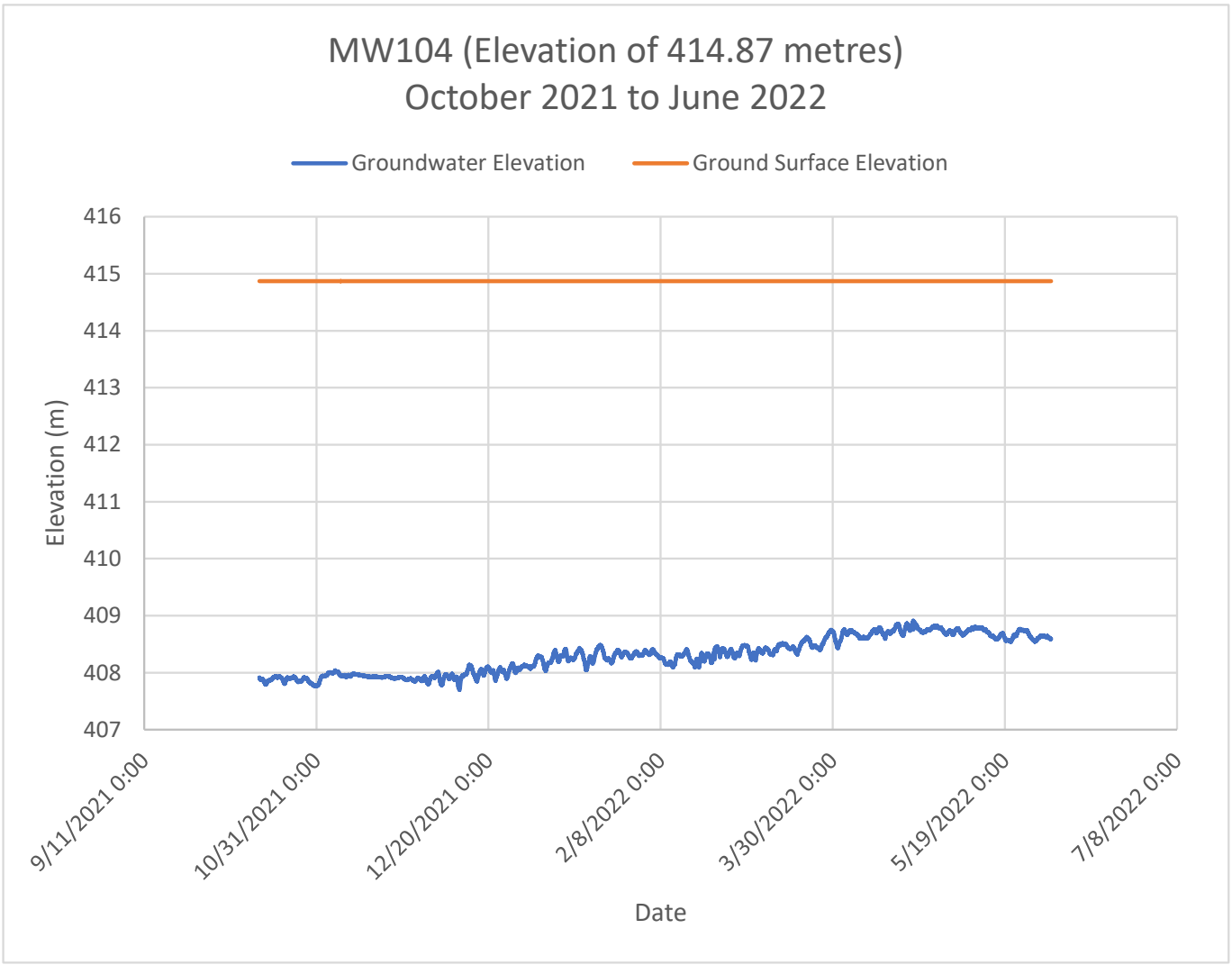

MW 004 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
406.00
405.50
405.00
404.50
404.00
403.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

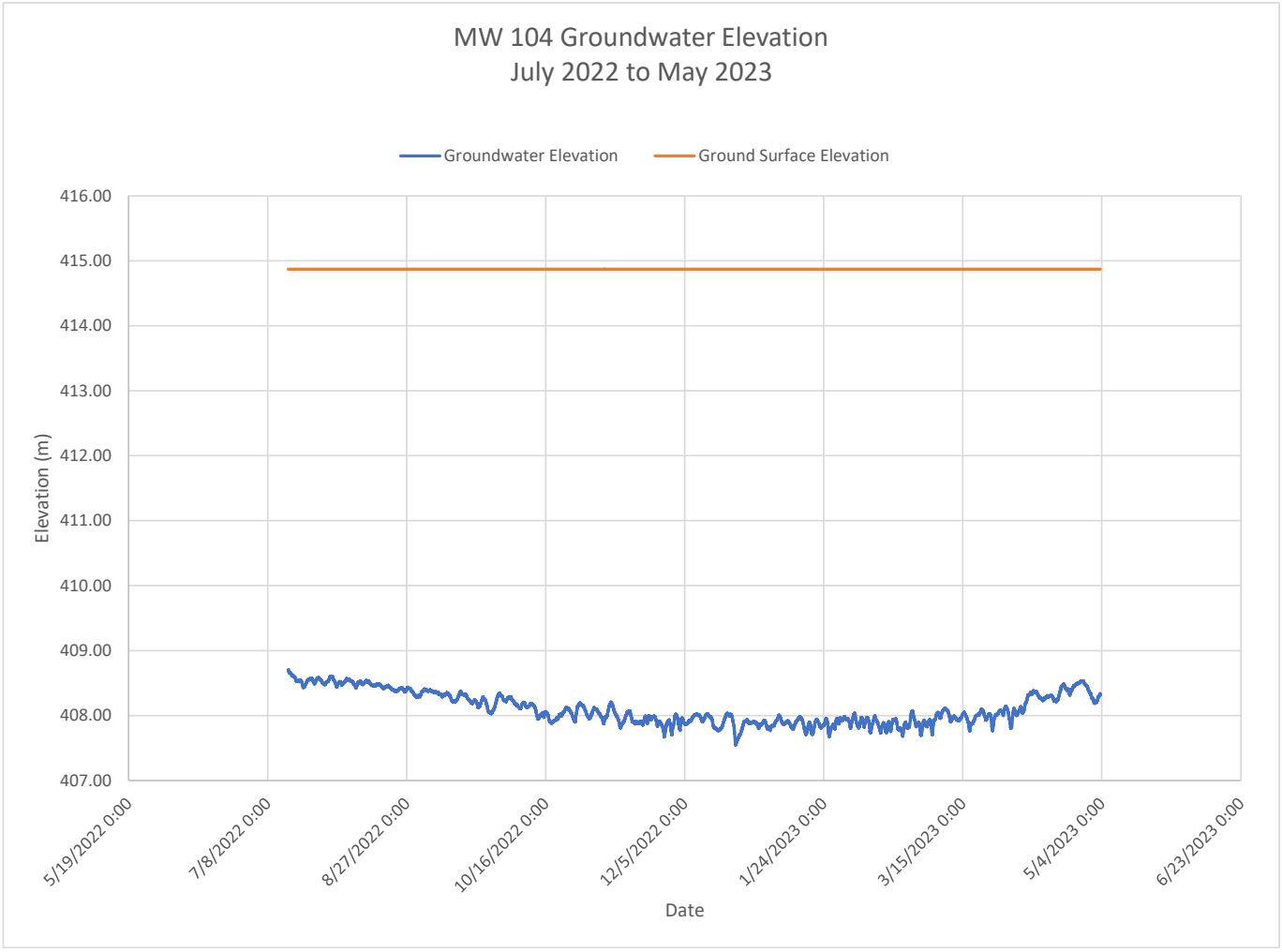

MW 101 (Elevation of 408.60 metres)
October 2021 to June 2022
Groundwater Elevation
Ground Surface Elevation
409
408
407
406
405
404
403
Elevation (m)
9/11/2021 0:00
10/31/2021 0:00
12/20/2021 0:00
2/8/2022 0:00
3/30/2022 0:00
5/19/2022 0:00
7/8/2022 0:00
Date

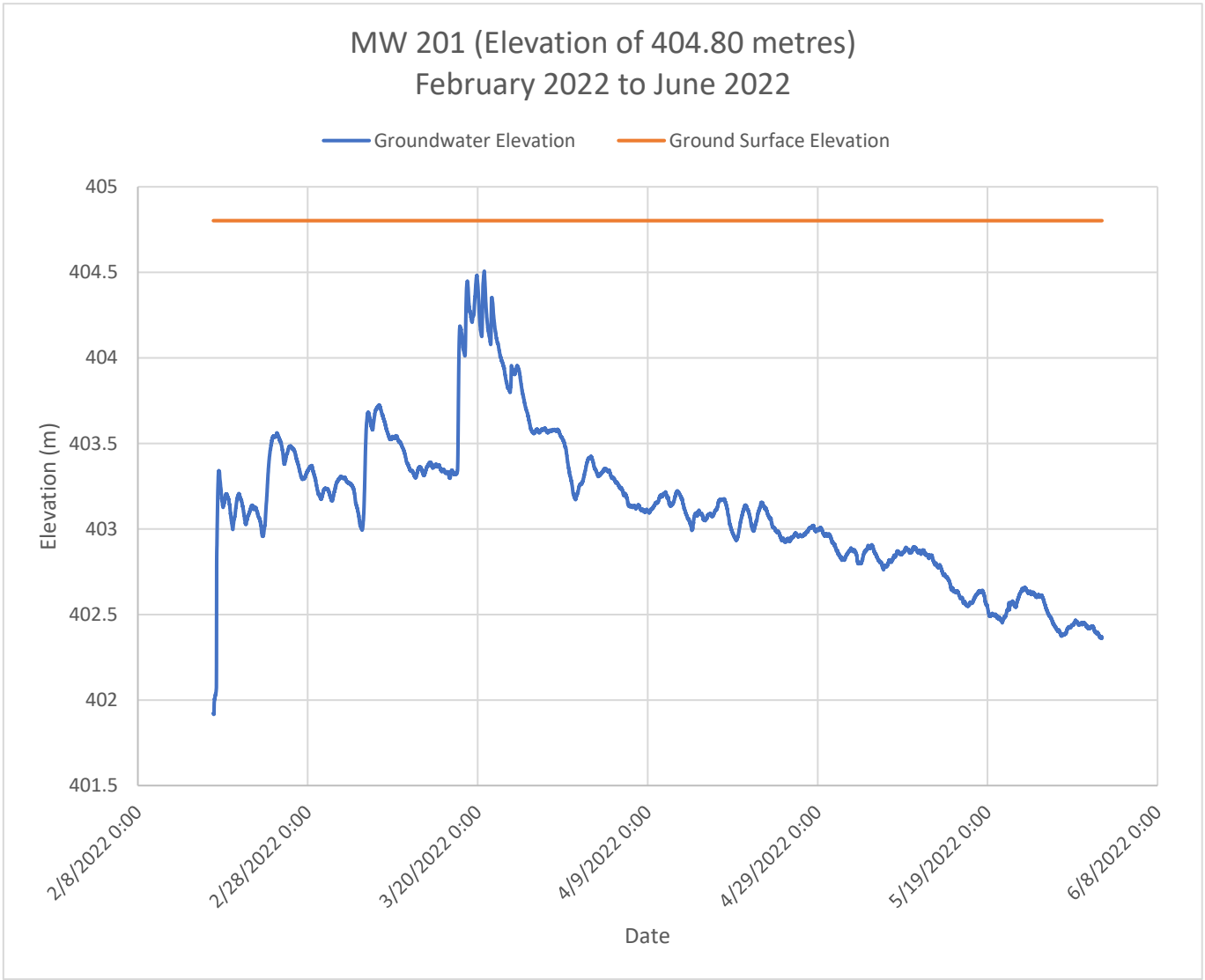

MW 101 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Groundsurface Elevation
409
408
407
406
405
404
403
402
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

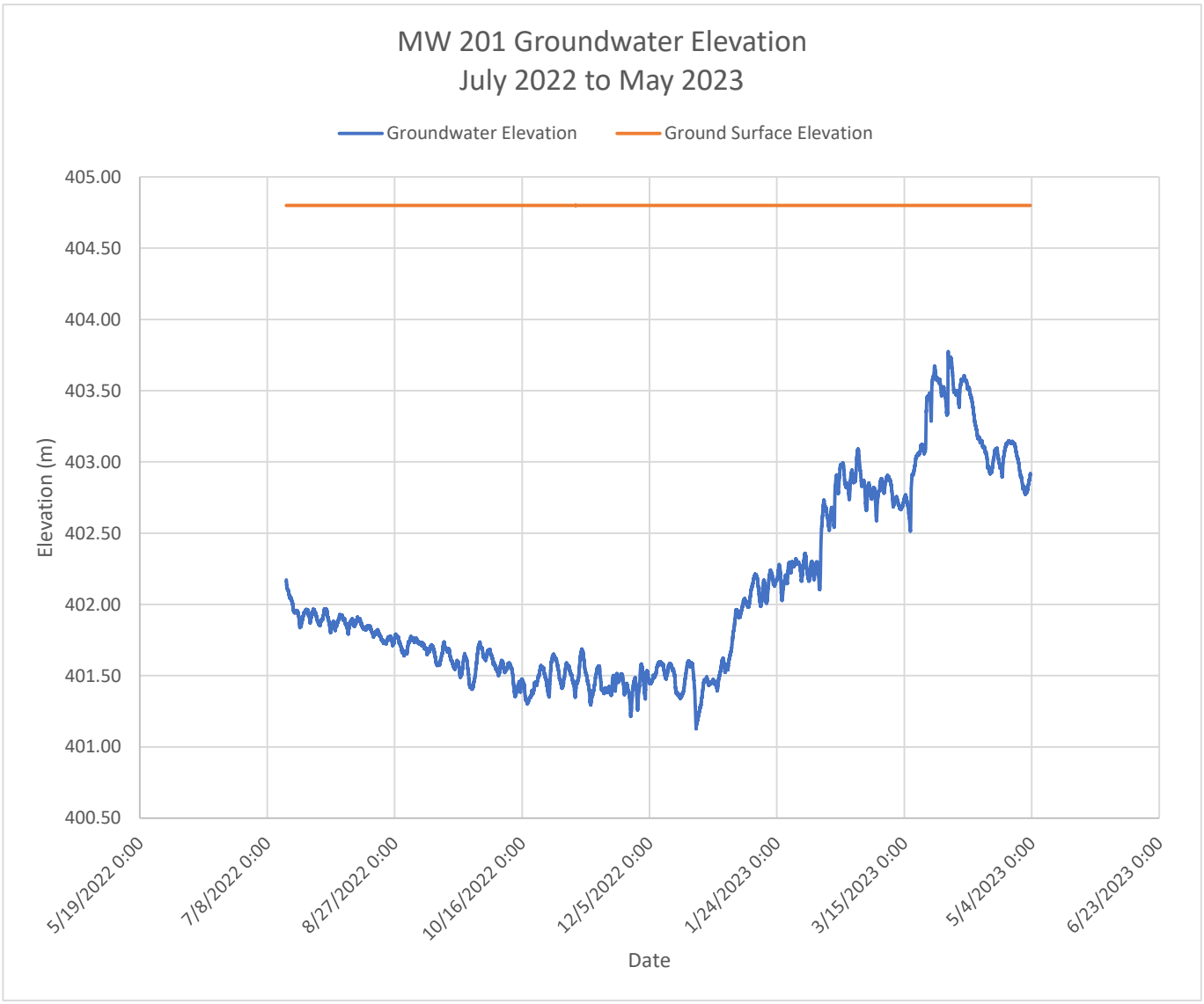

MW 102 (Elevation of 414.13 metres)
October 2021 to June 2022
Groundwater Elevation
Ground Surface Elevation
414.5
414
413.5
413
412.5
412
411.5
411
410.5
410
409.5
Elevation (m)
9/11/2021 0:00
10/31/2021 0:00
12/20/2021 0:00
2/8/2022 0:00
3/30/2022 0:00
5/19/2022 0:00
7/8/2022 0:00
Date

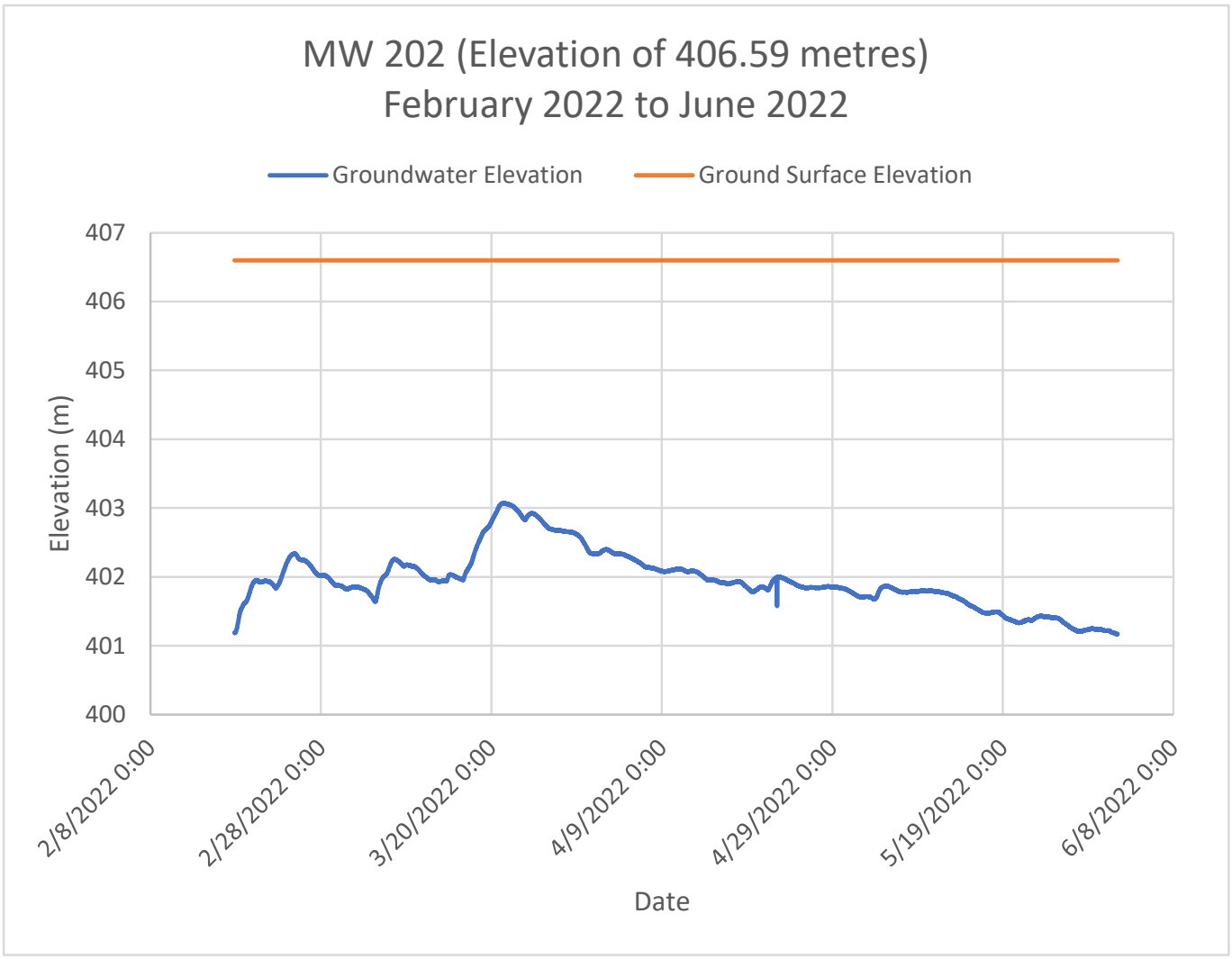

MW 102 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
414.50
414.00
413.50
413.00
412.50
412.00
411.50
411.00
410.50
410.00
409.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

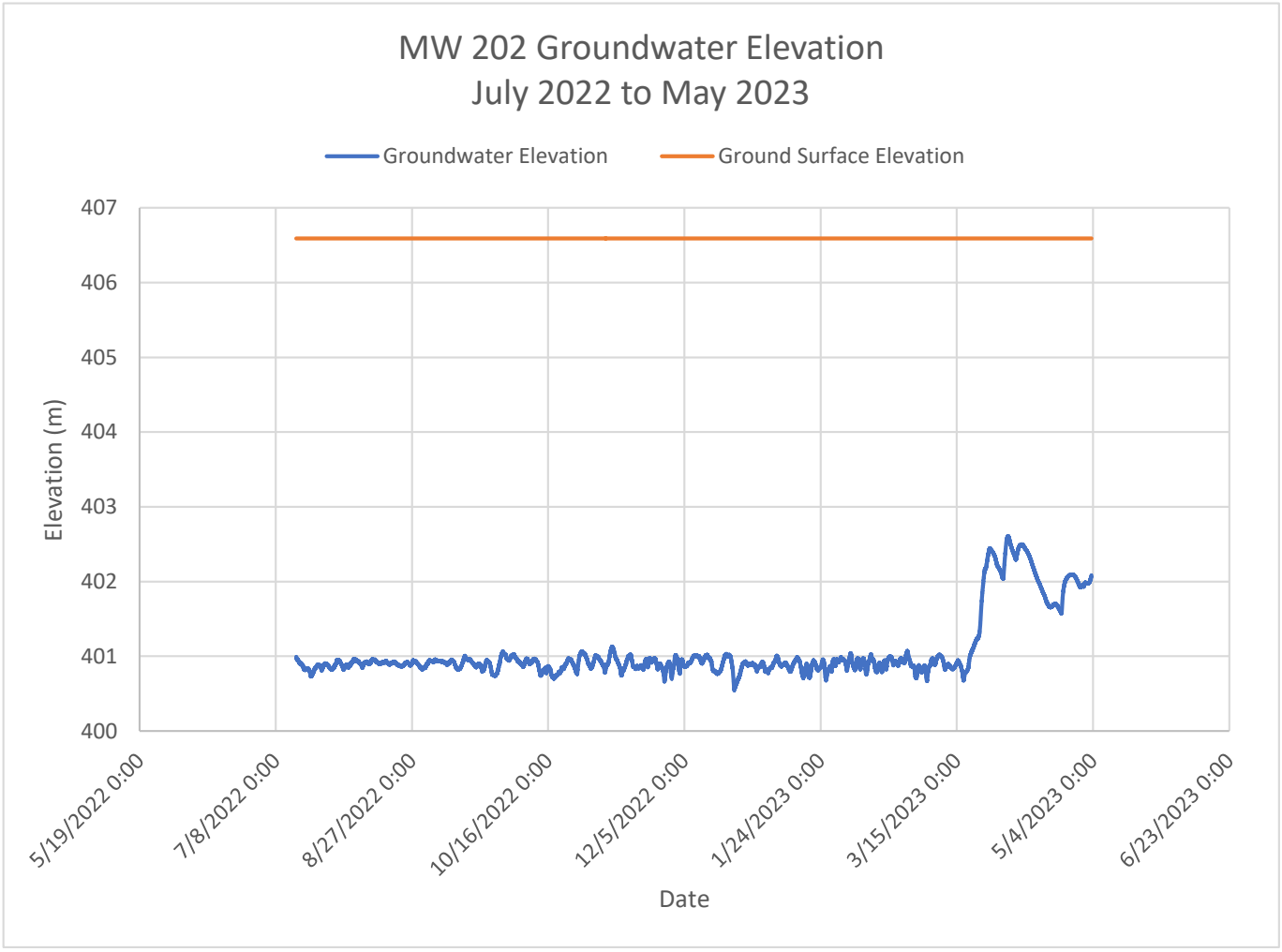

MW104 (Elevation of 414.87 metres)
October 2021 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
416
415
414
413
412
411
410
409
408
407
9/11/2021 0:00
10/31/2021 0:00
12/20/2021 0:00
2/8/2022 0:00
3/30/2022 0:00
5/19/2022 0:00
7/8/2022 0:00
Date

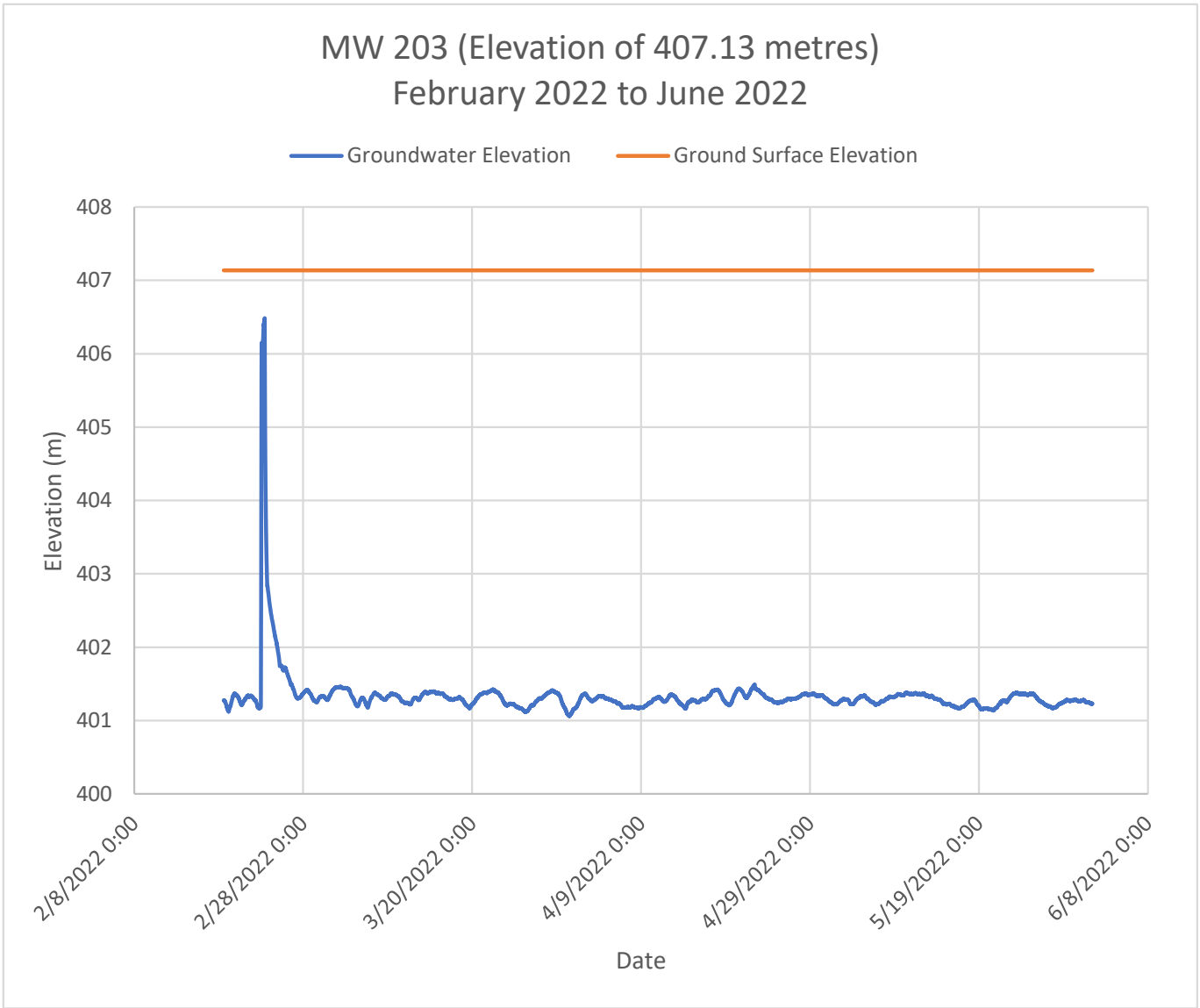

MW 104 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
416.00
415.00
414.00
413.00
412.00
411.00
410.00
409.00
408.00
407.00
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

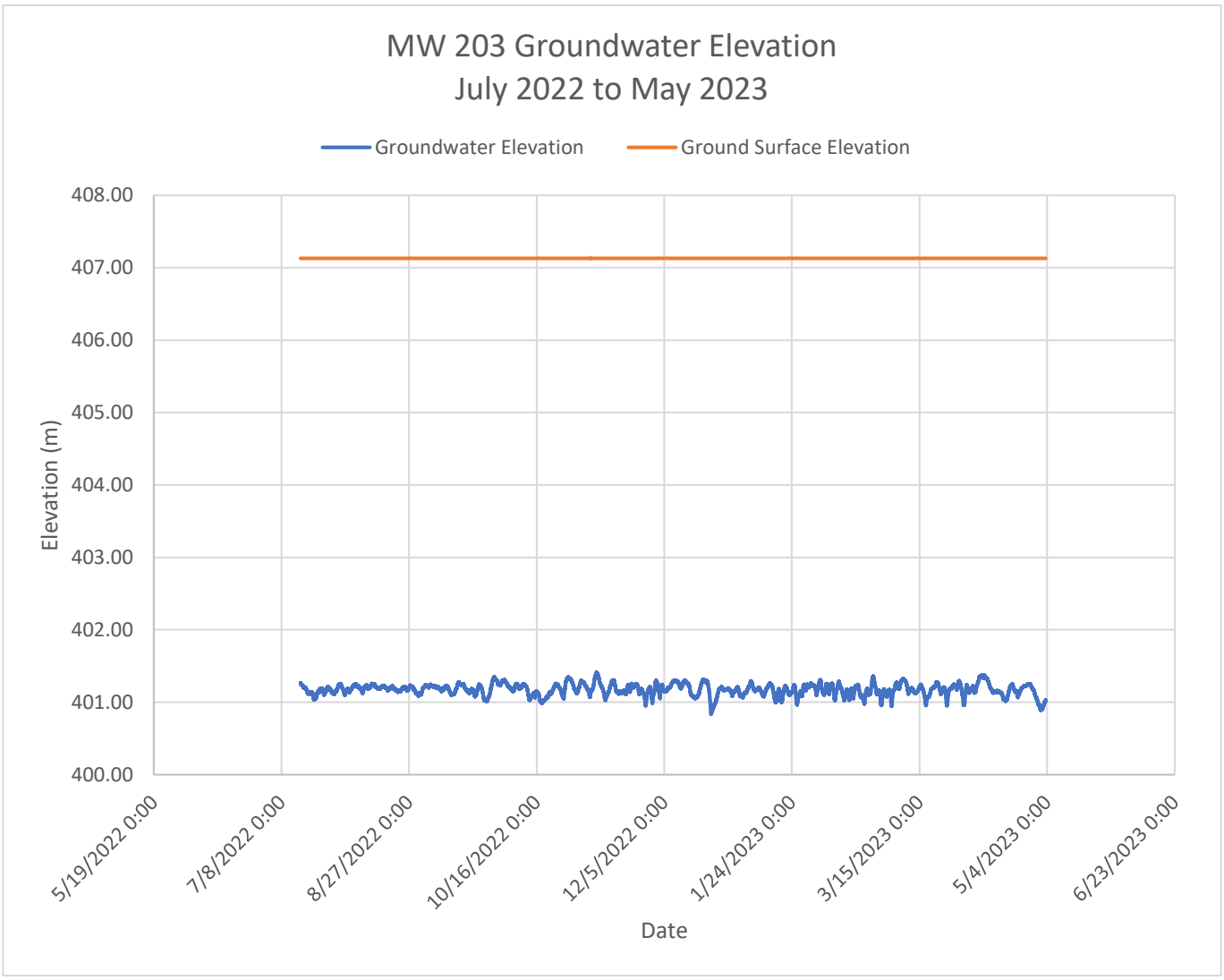

MW 201 (Elevation of 404.80 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
405
404.5
404
403.5
403
402.5
402
401.5
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

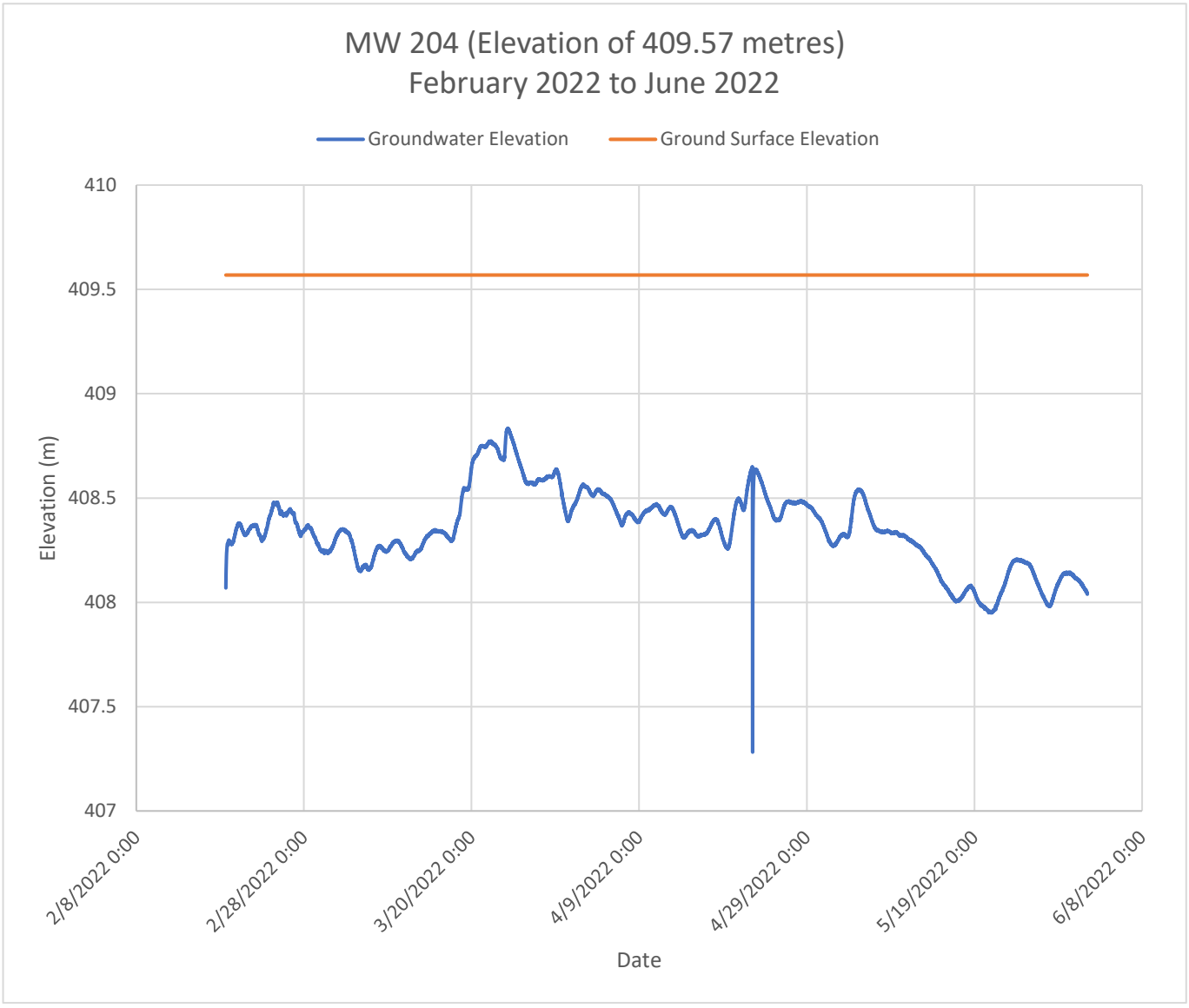

MW 201 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
405.00
404.50
404.00
403.50
403.00
402.50
402.00
401.50
401.00
400.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

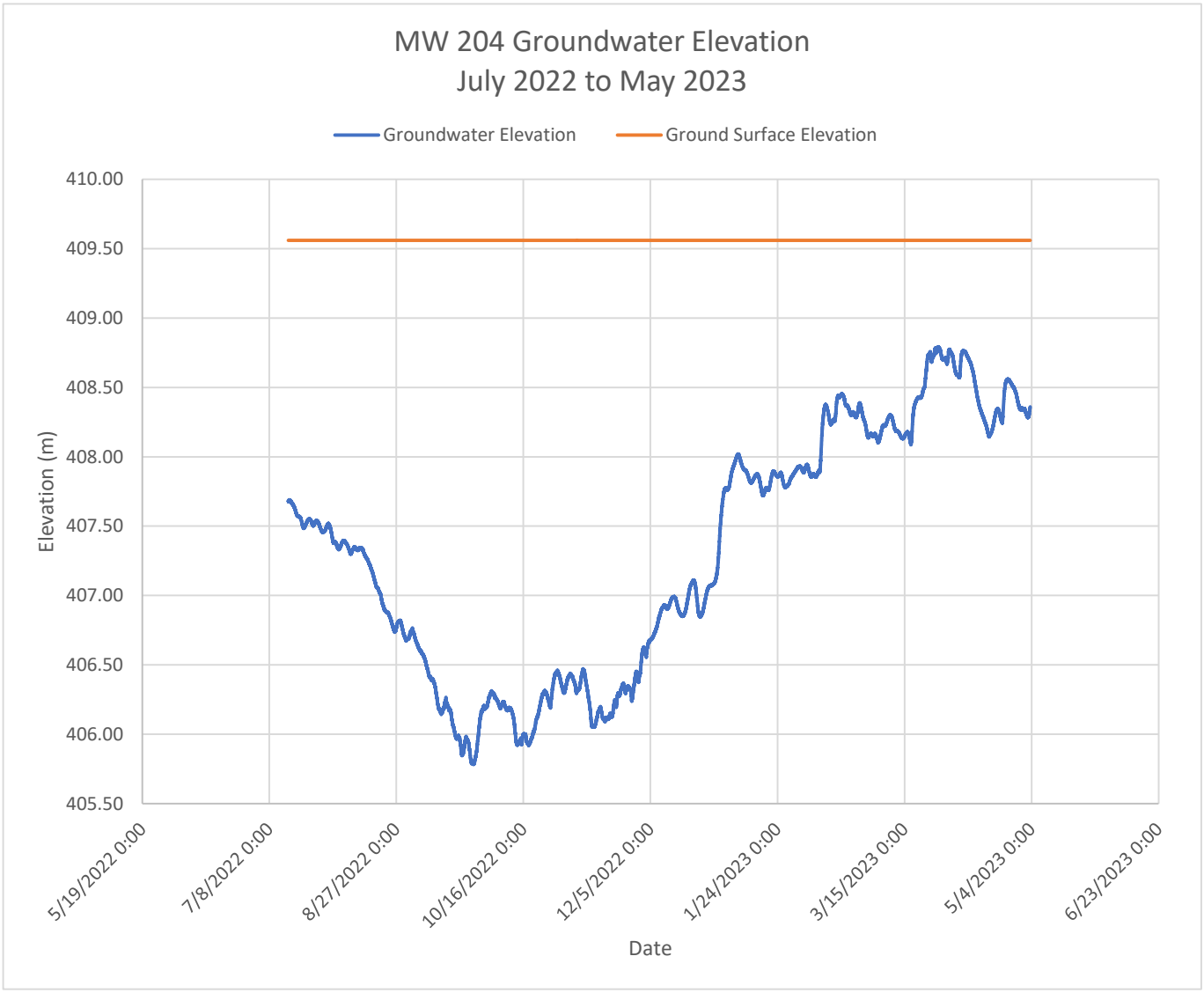

MW 202 (Elevation of 406.59 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
407
406
405
404
403
402
401
400
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

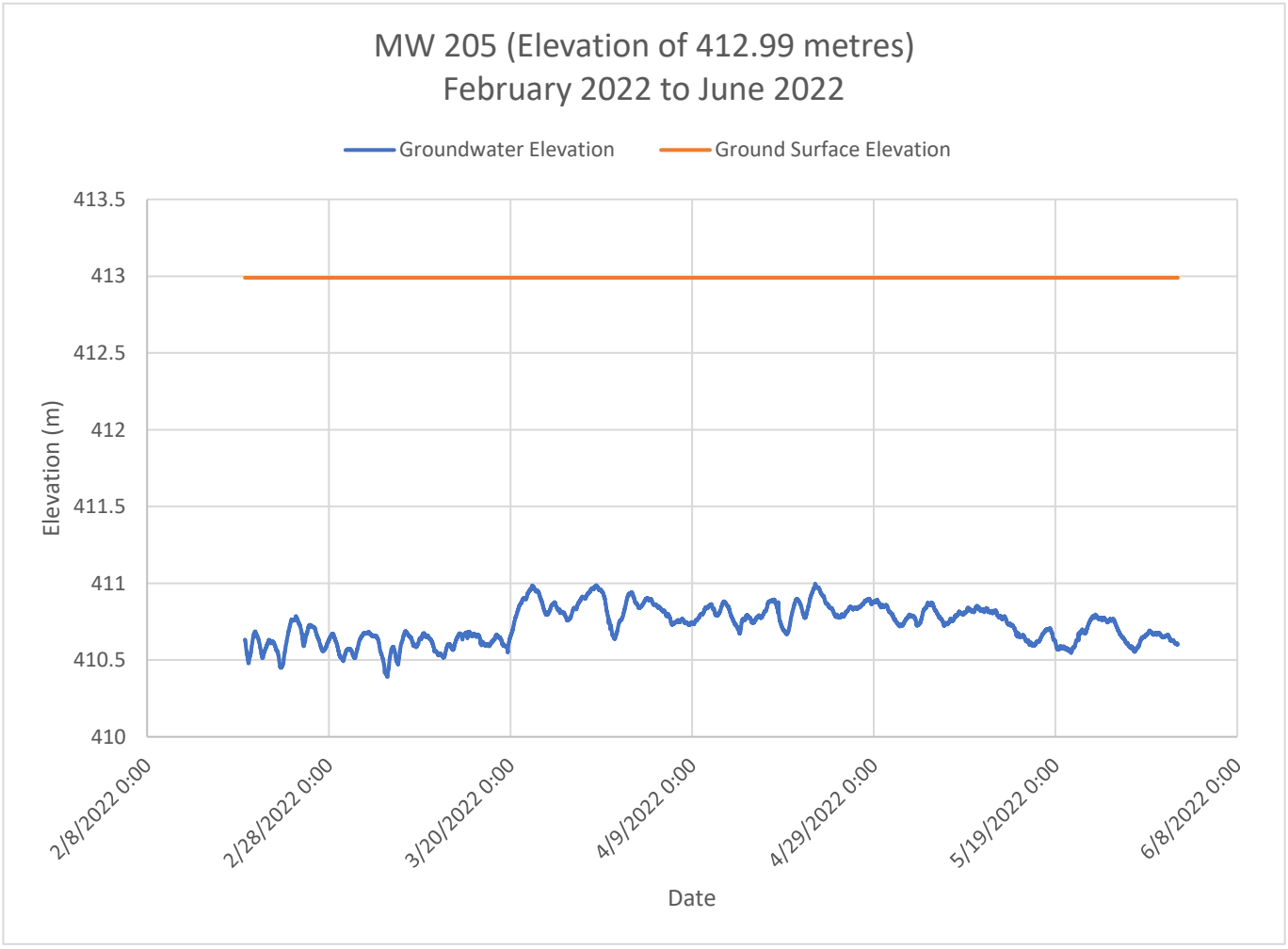

MW 202 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
407
406
405
404
403
402
401
400
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

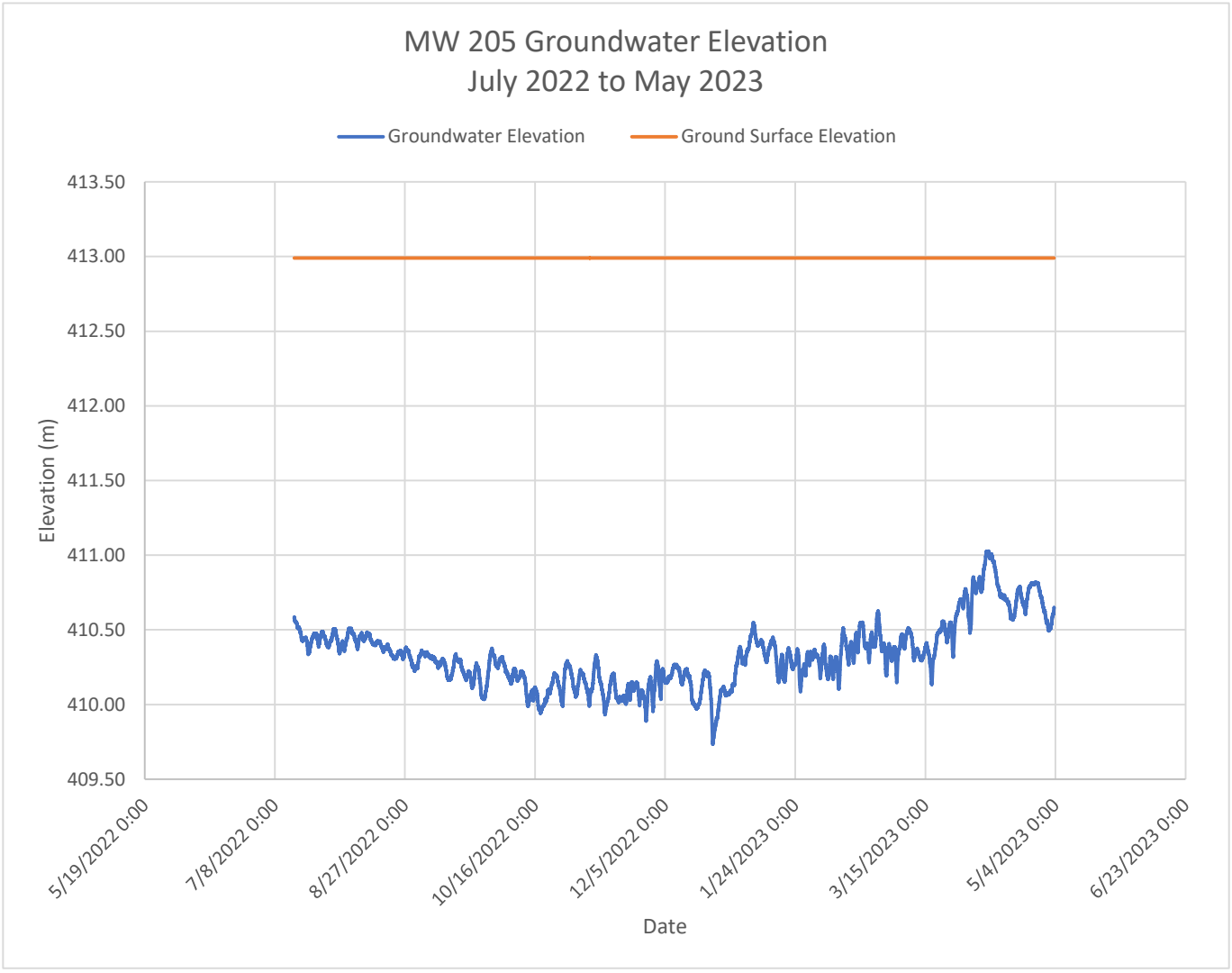

MW 203 (Elevation of 407.13 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
408
407
406
405
404
403
402
401
400
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

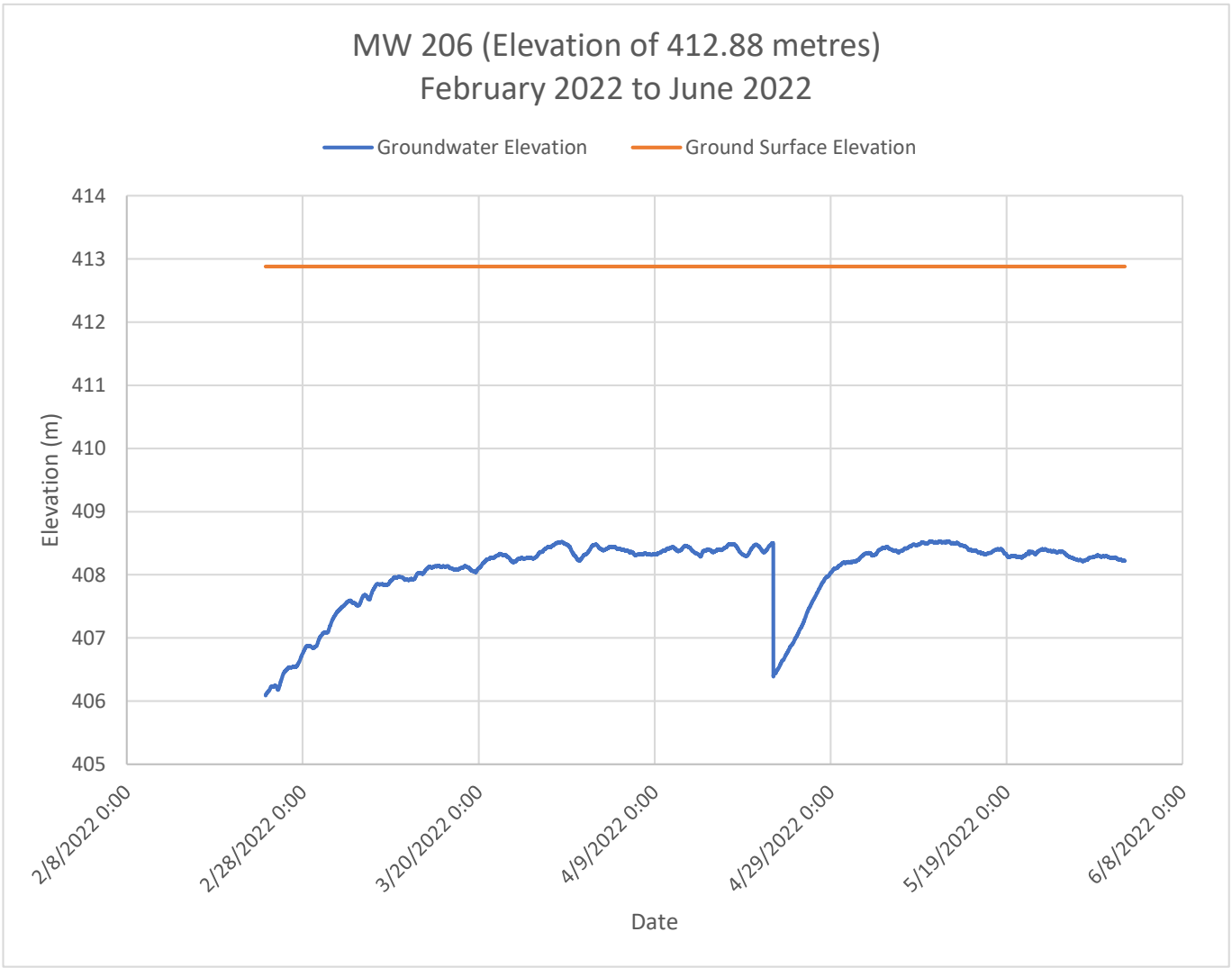

MW 203 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
408.00
407.00
406.00
405.00
404.00
403.00
402.00
401.00
400.00
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

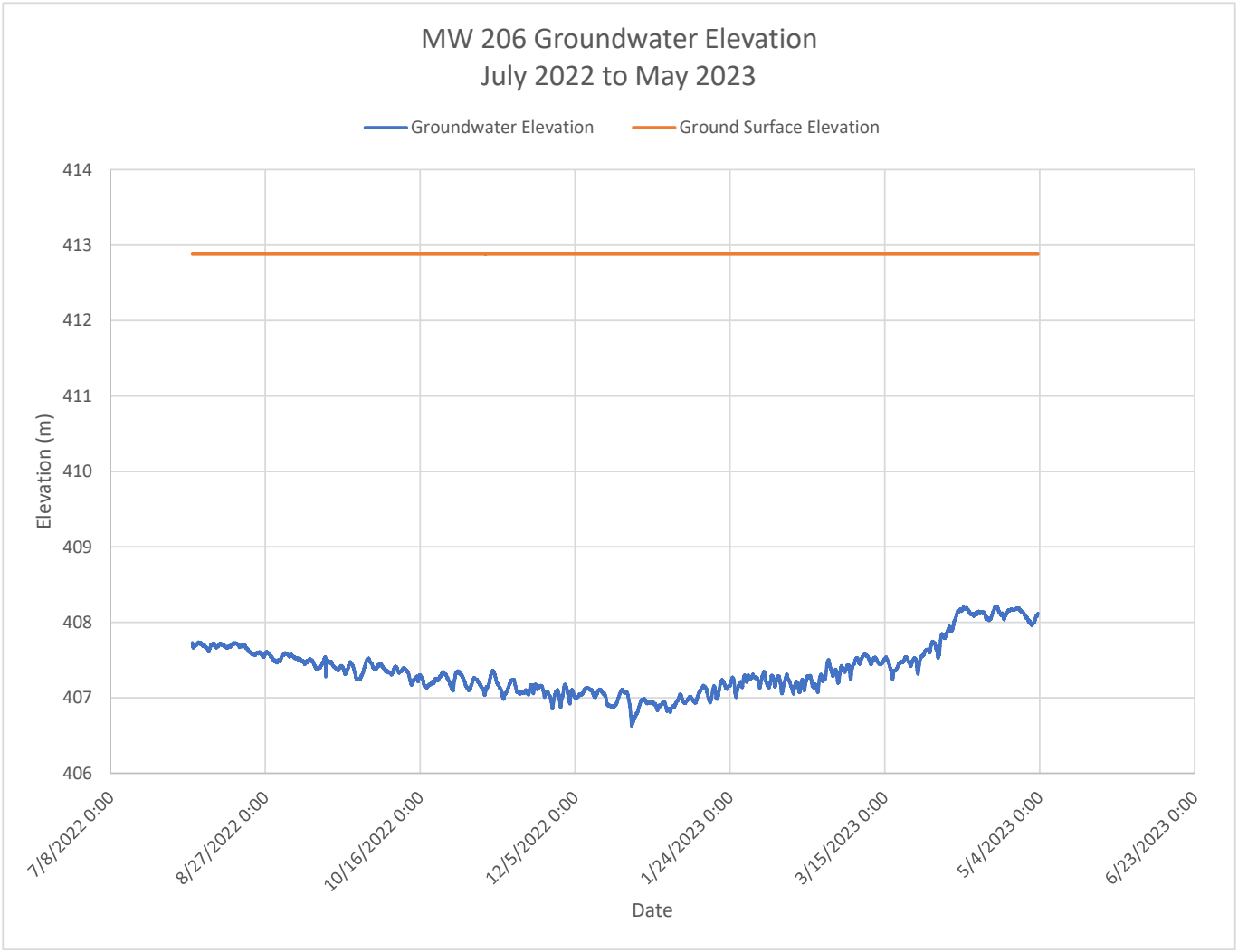

MW 204 (Elevation of 409.57 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
410
409.5
409
408.5
408
407.5
407
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

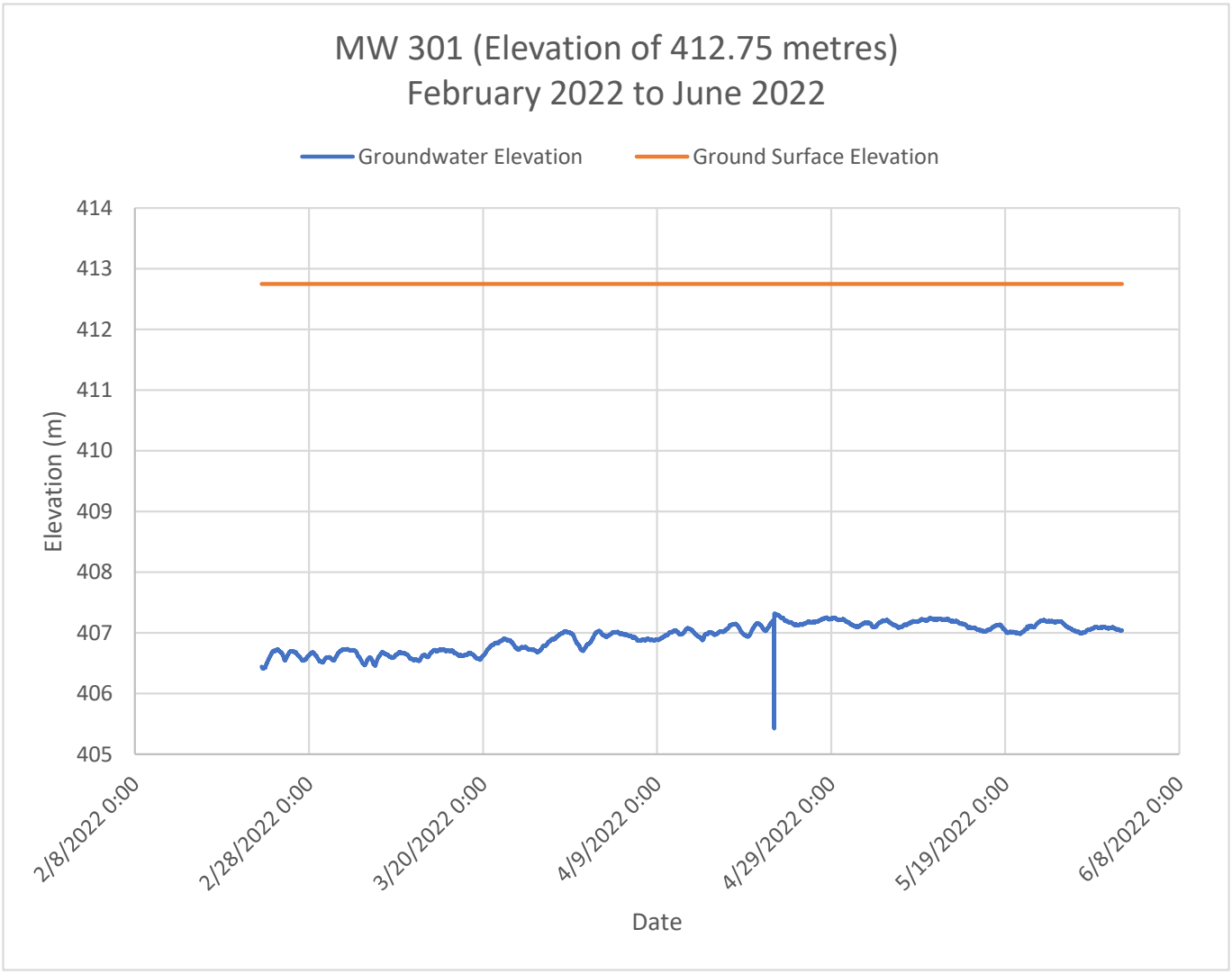

MW 204 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
410.00
409.50
409.00
408.50
408.00
407.50
407.00
406.50
406.00
405.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

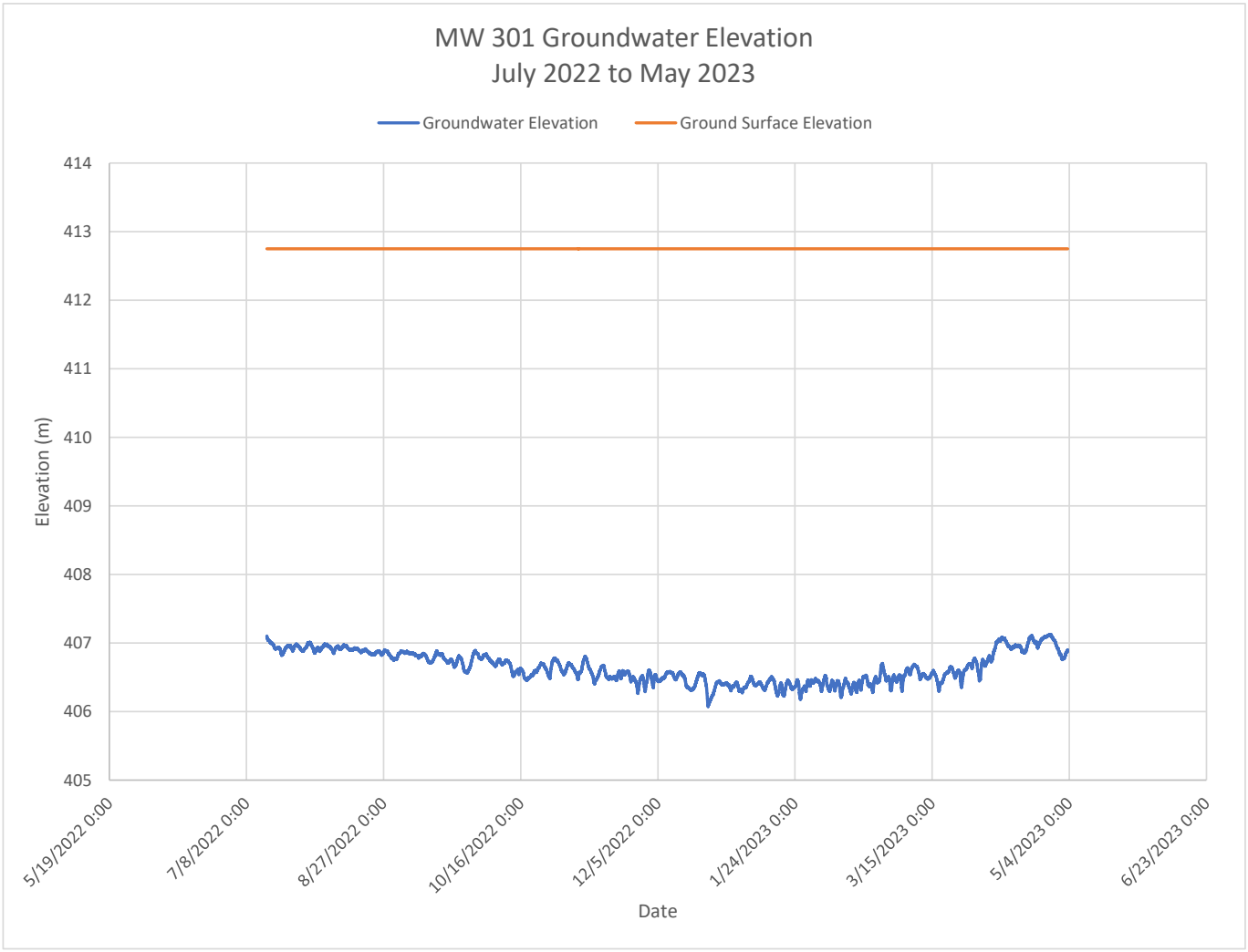

MW 205 (Elevation of 412.99 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
413.5
413
412.5
412
411.5
411
410.5
410
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

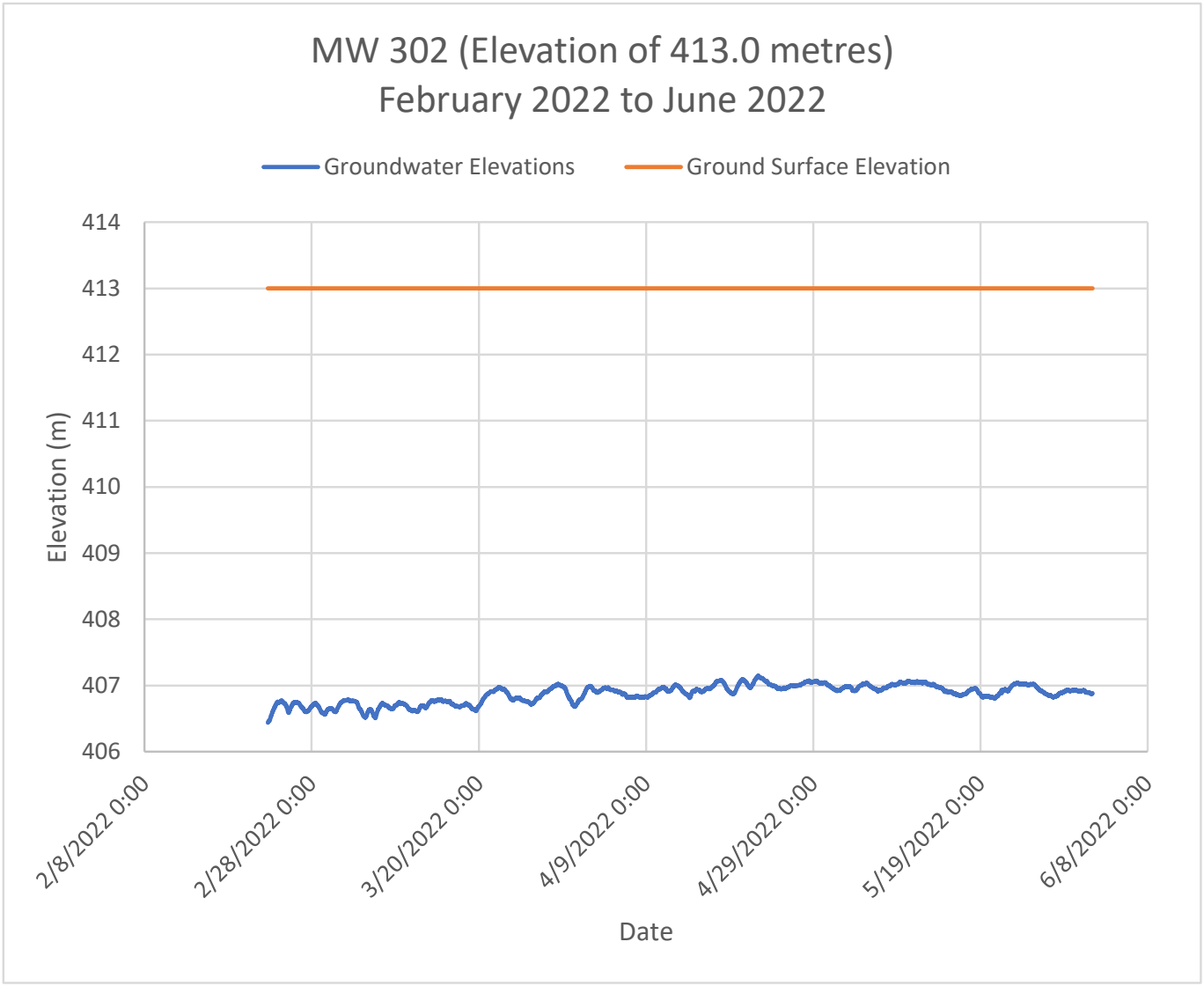

MW 205 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
413.50
413.00
412.50
412.00
411.50
411.00
410.50
410.00
409.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

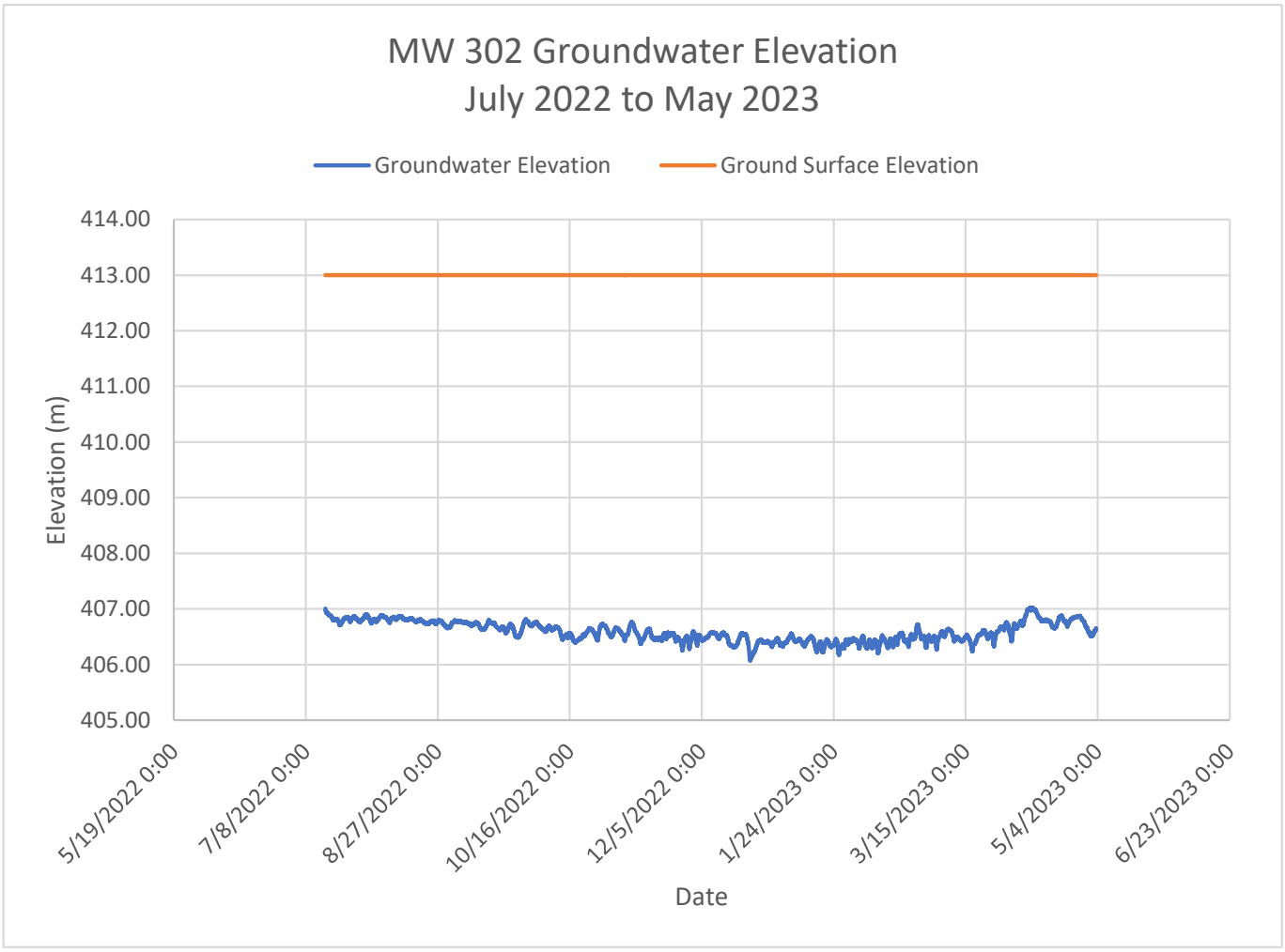

MW 206 (Elevation of 412.88 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

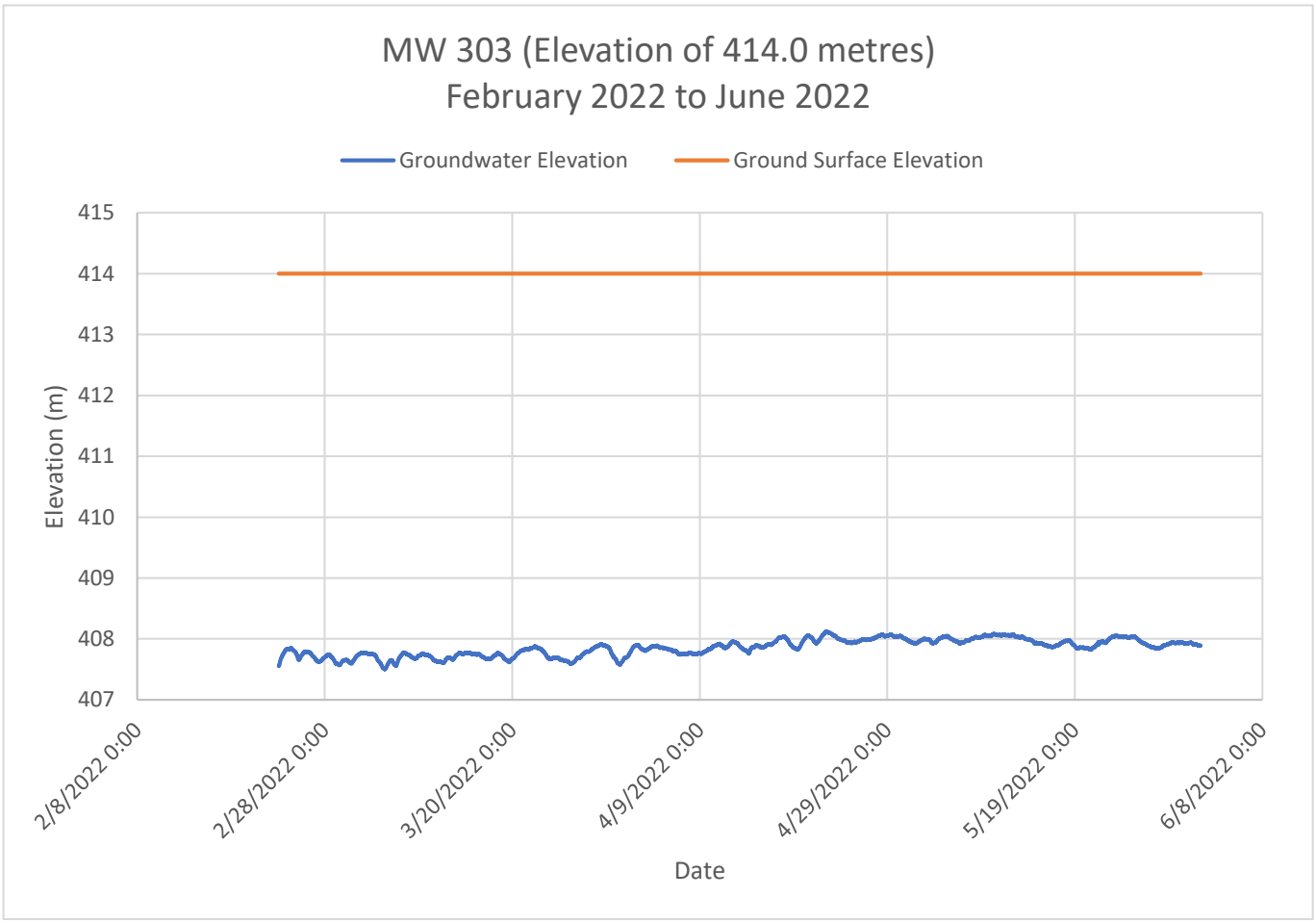

MW 206 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
Elevation (m)
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

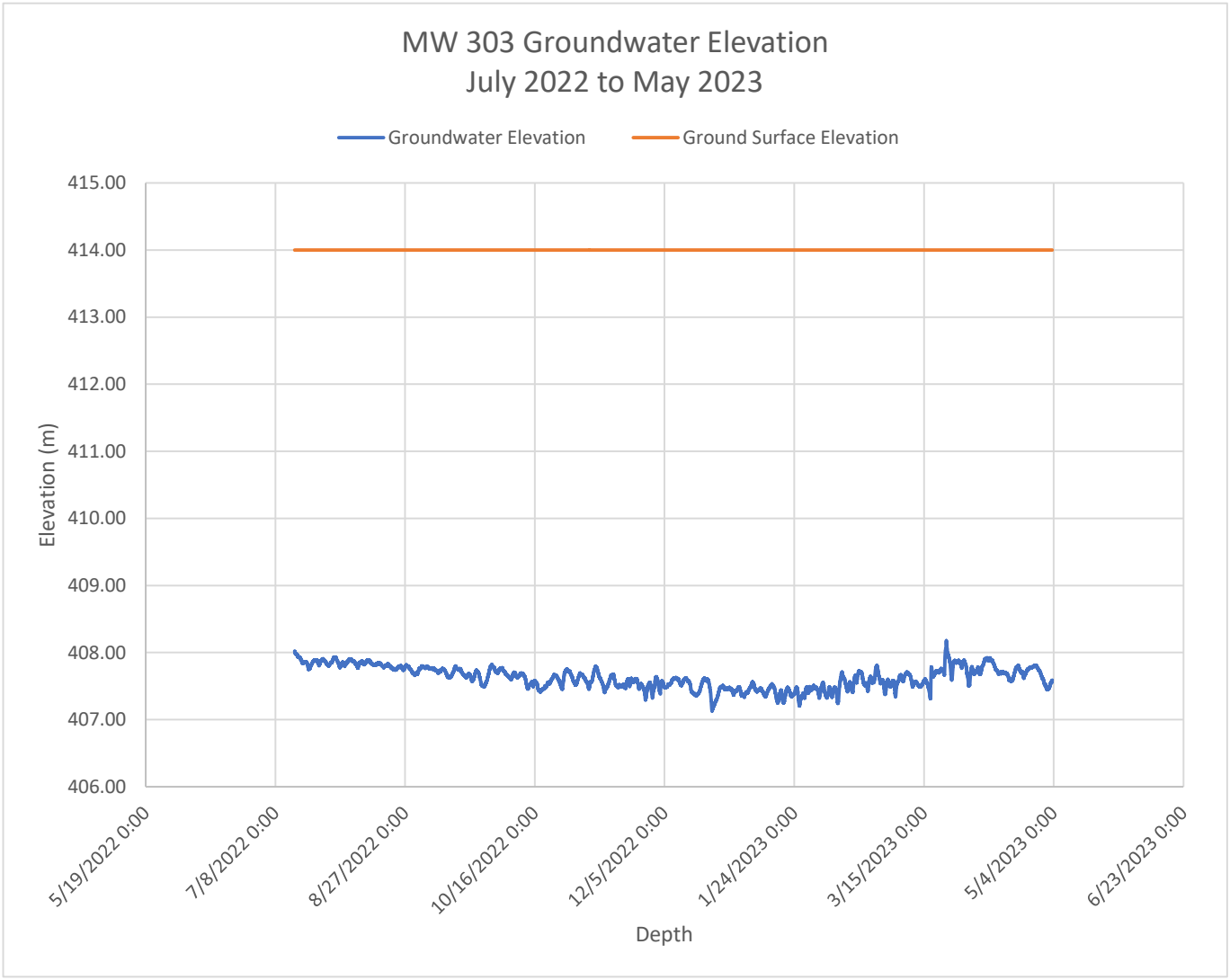

MW 301 (Elevation of 412.75 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

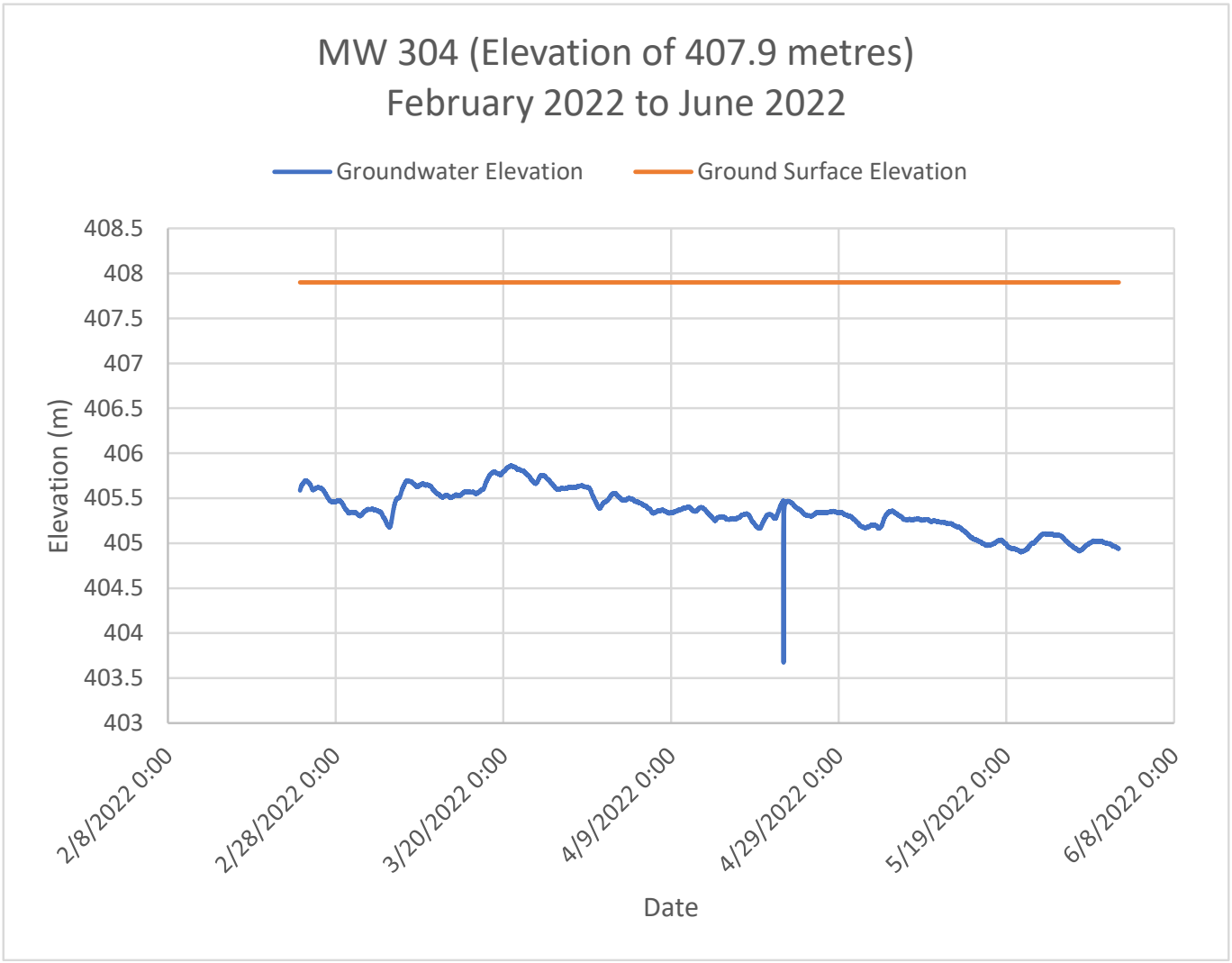

MW 301 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

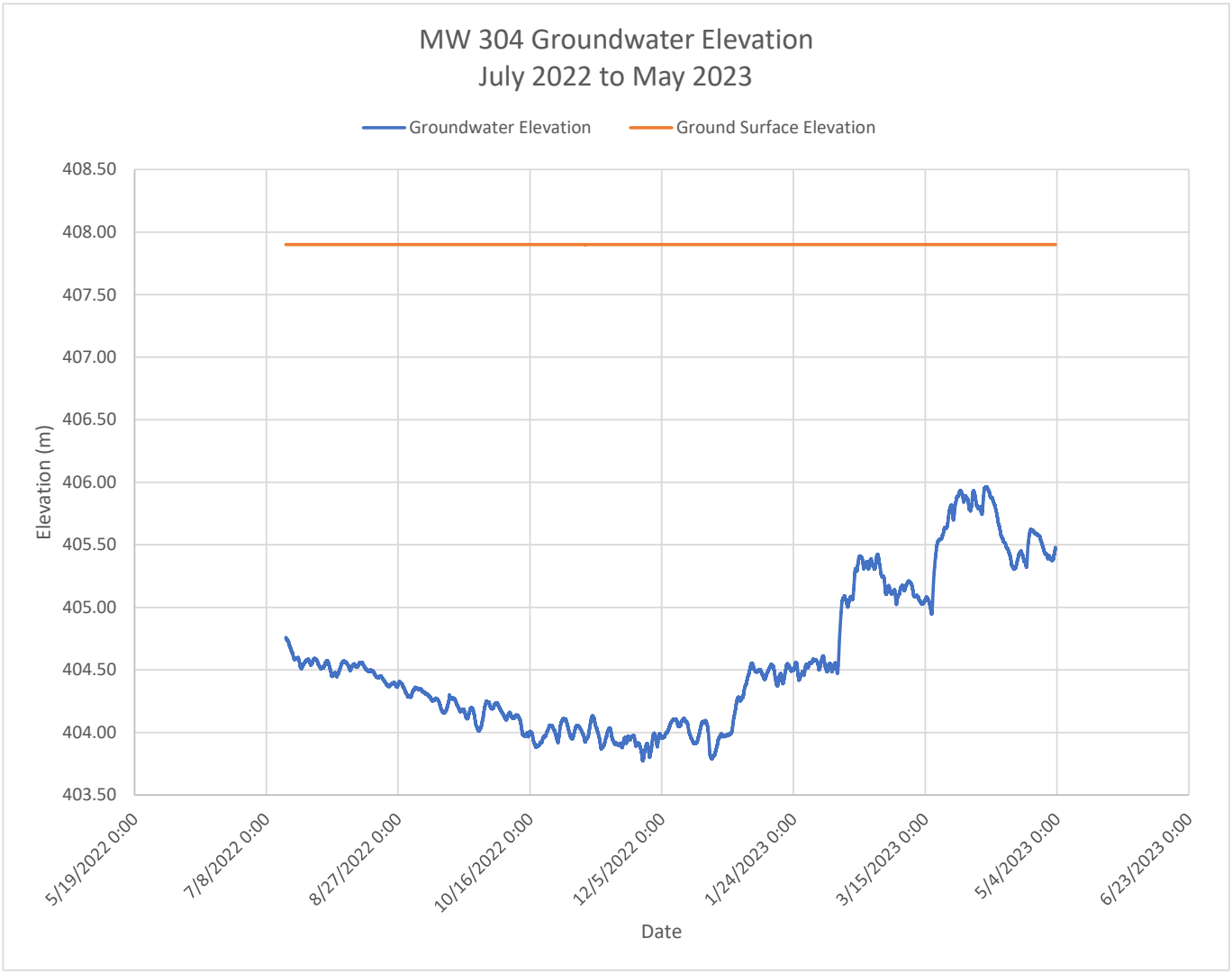

MW 302 (Elevation of 413.0 metres)
February 2022 to June 2022
Groundwater Elevations
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

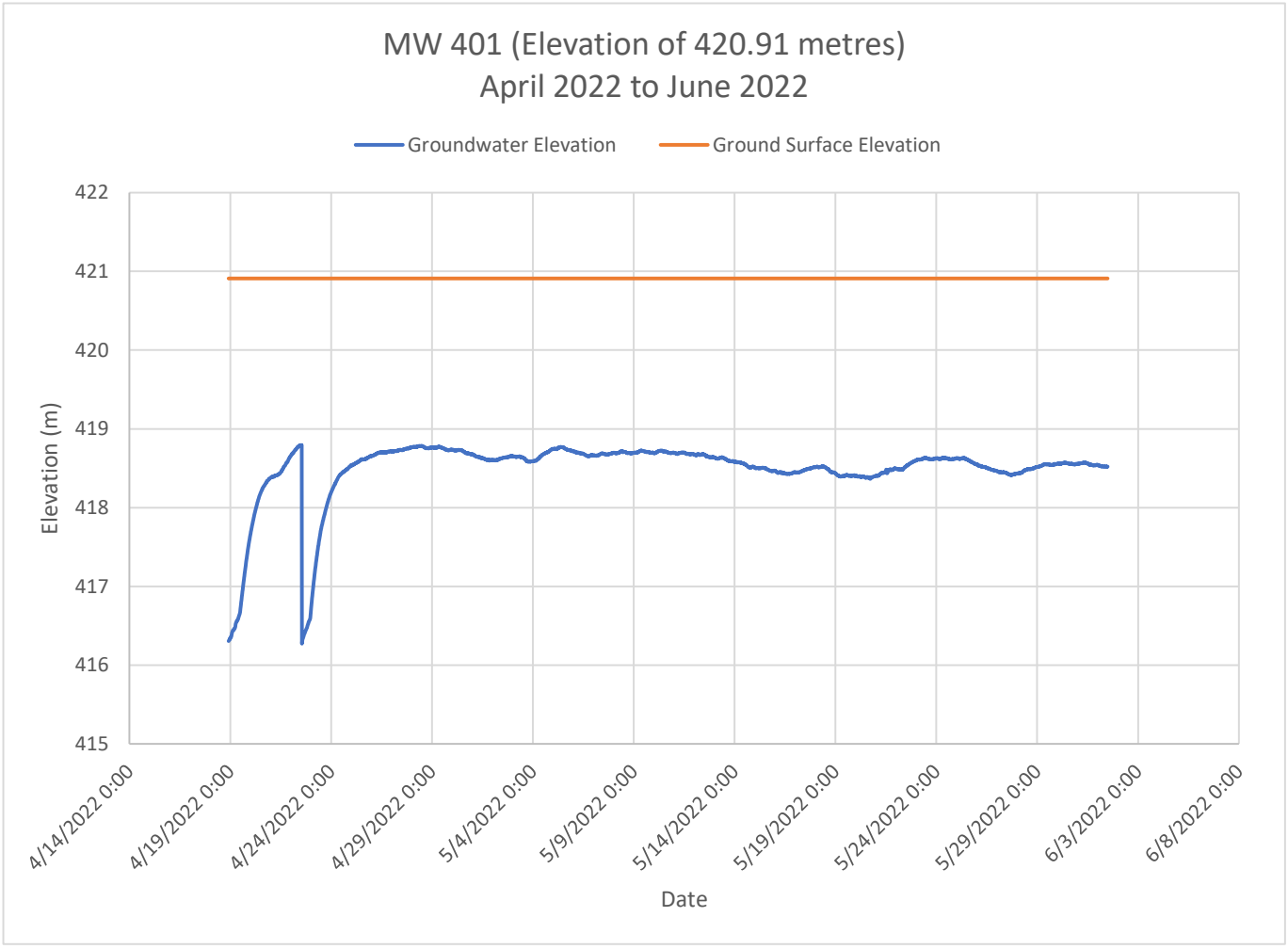

MW 302 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
414.00
413.00
412.00
411.00
410.00
409.00
408.00
407.00
406.00
405.00
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

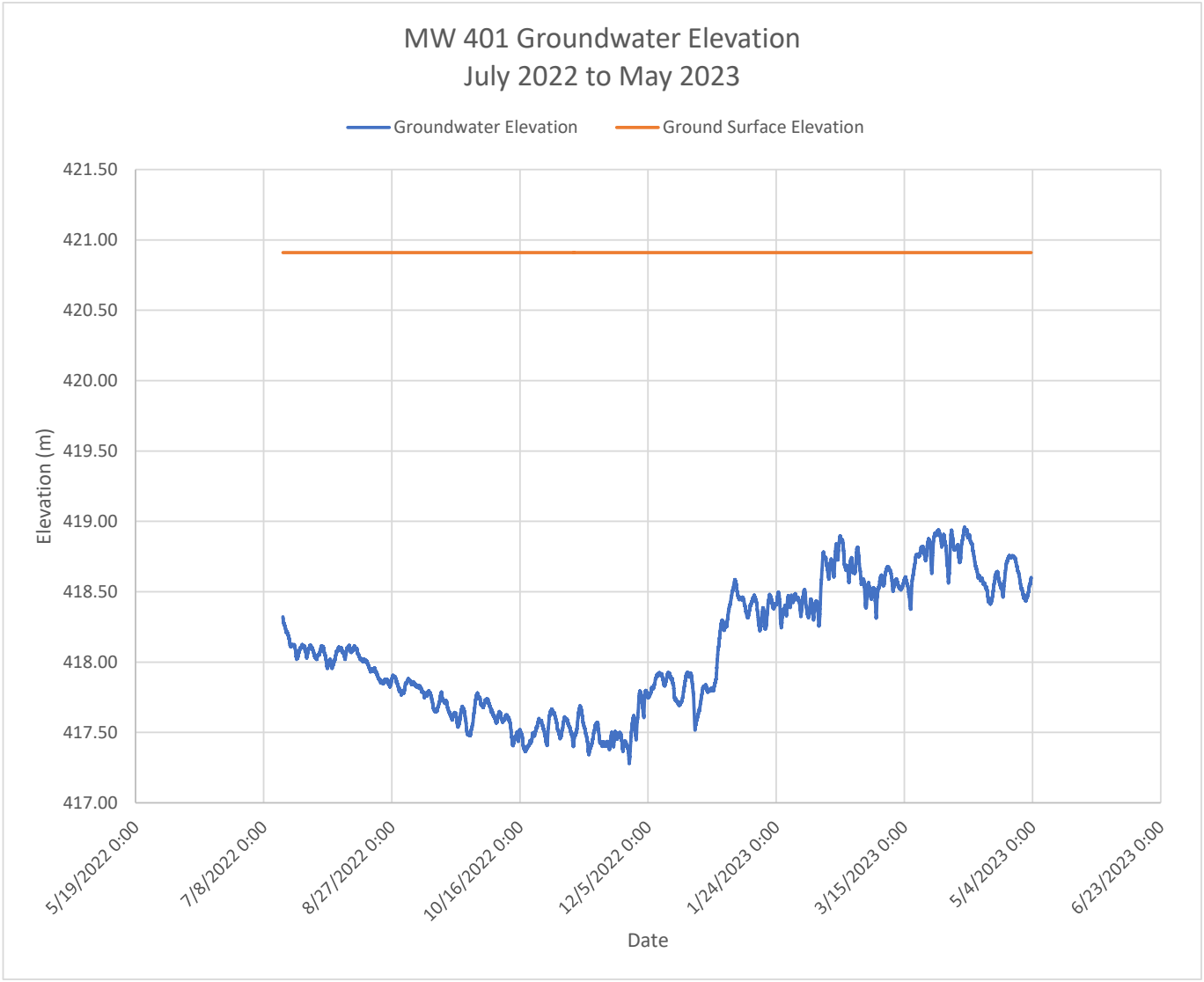

MW 303 (Elevation of 414.0 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
415
414
413
412
411
410
409
408
407
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

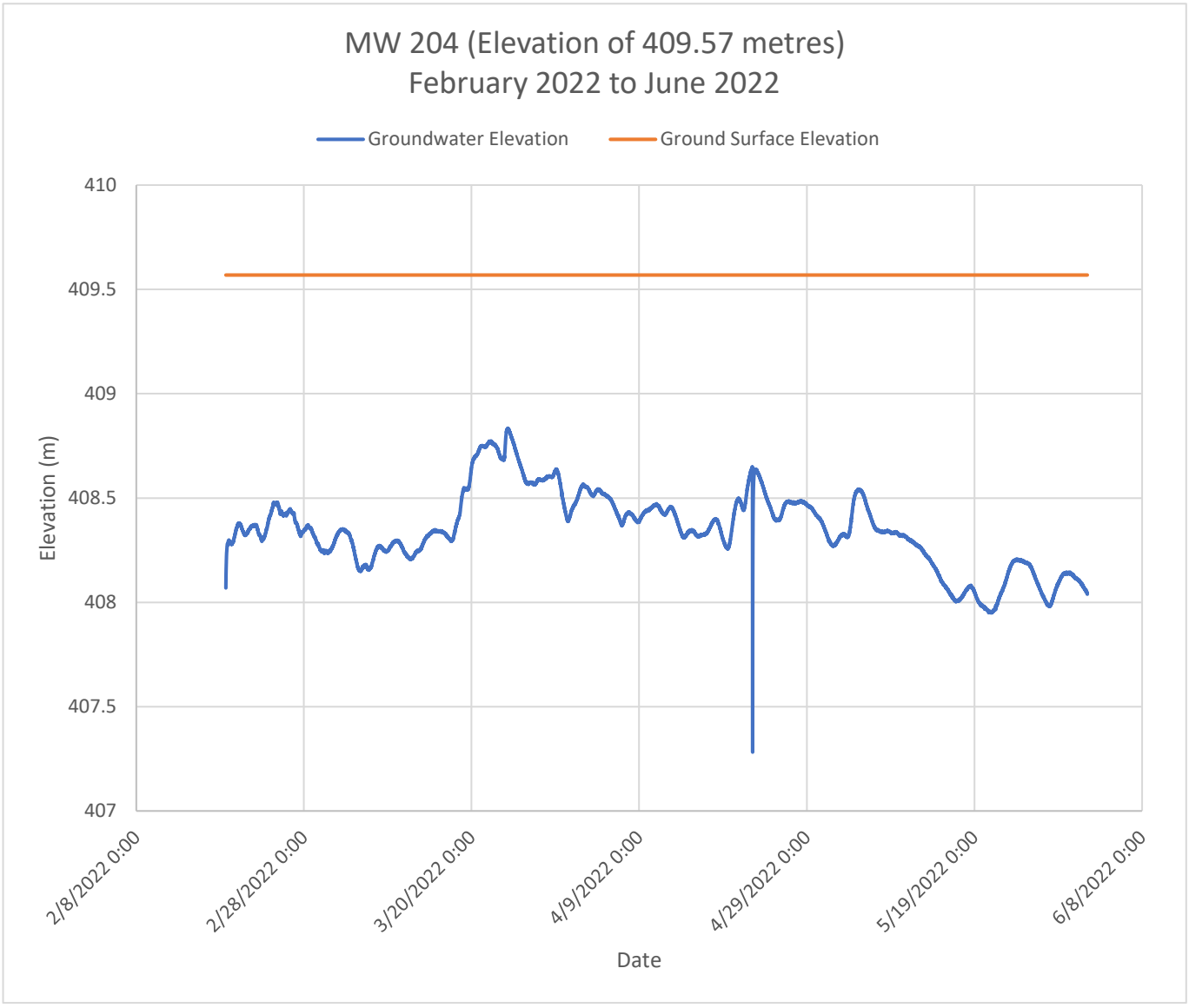

MW 303 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
415.00
414.00
413.00
412.00
411.00
410.00
409.00
408.00
407.00
406.00
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Depth

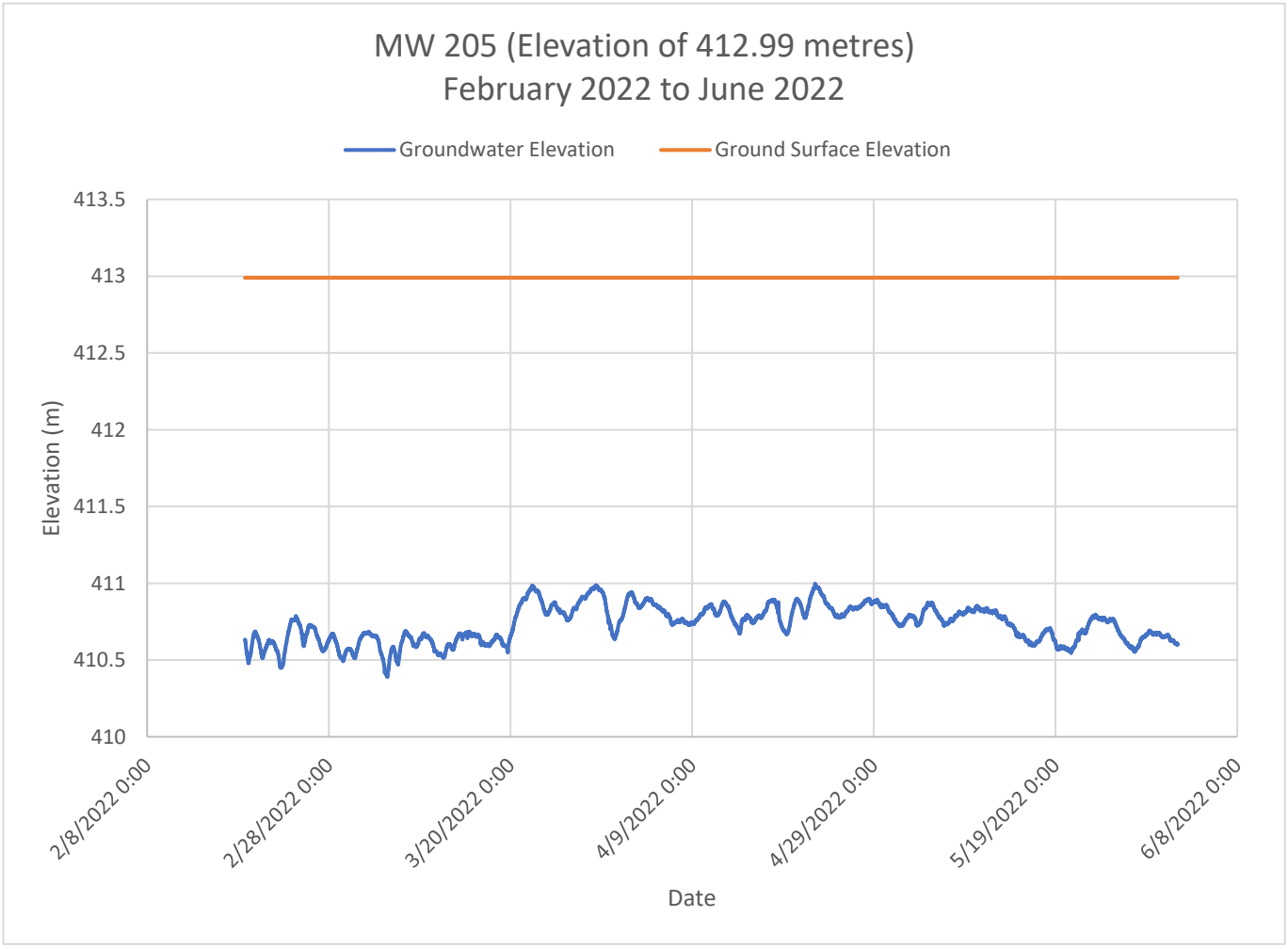

MW 304 (Elevation of 407.9 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
408.5
408
407.5
407
406.5
406
405.5
405
404.5
404
403.5
403
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

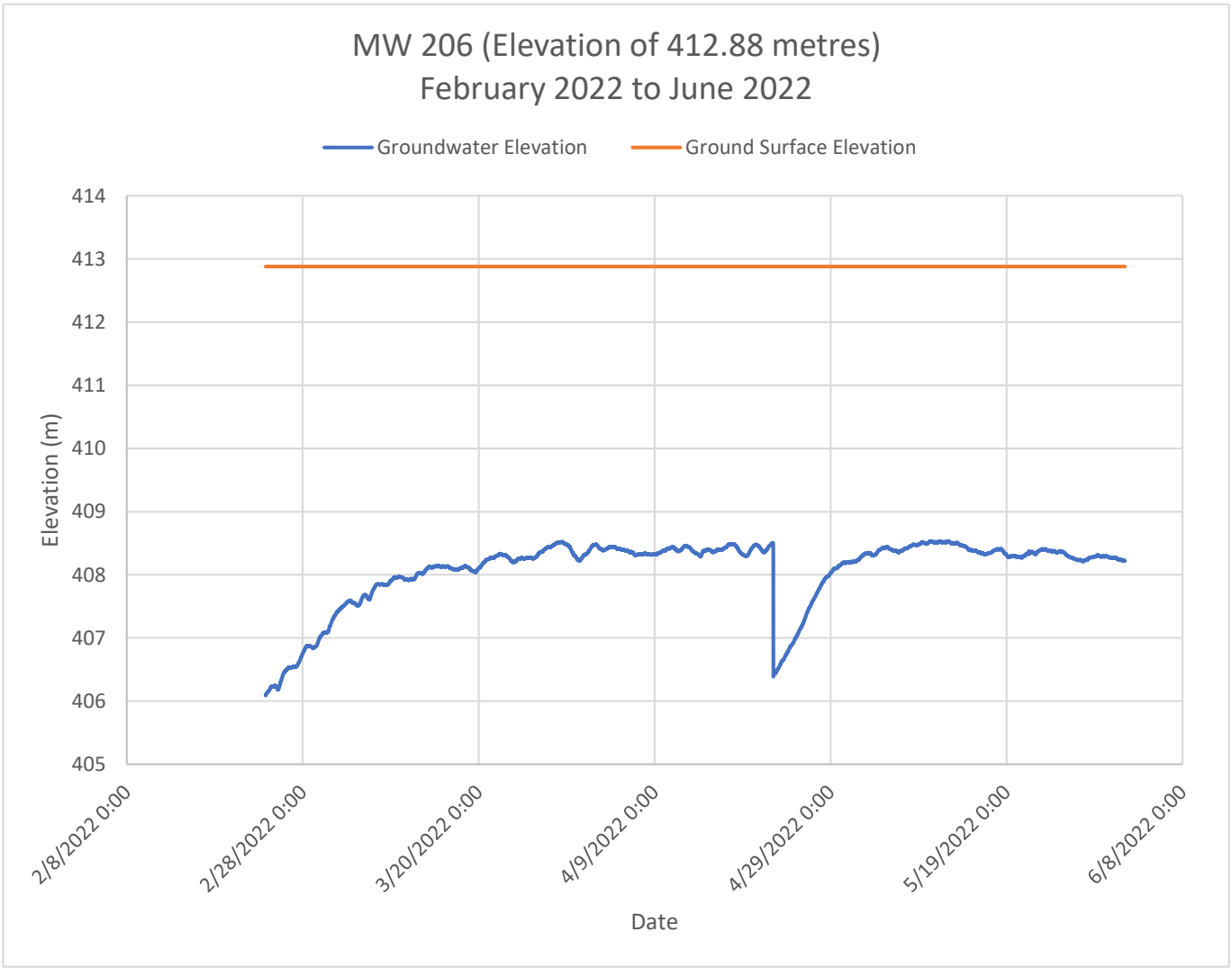

MW 304 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
408.50
408.00
407.50
407.00
406.50
406.00
405.50
405.00
404.50
404.00
403.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

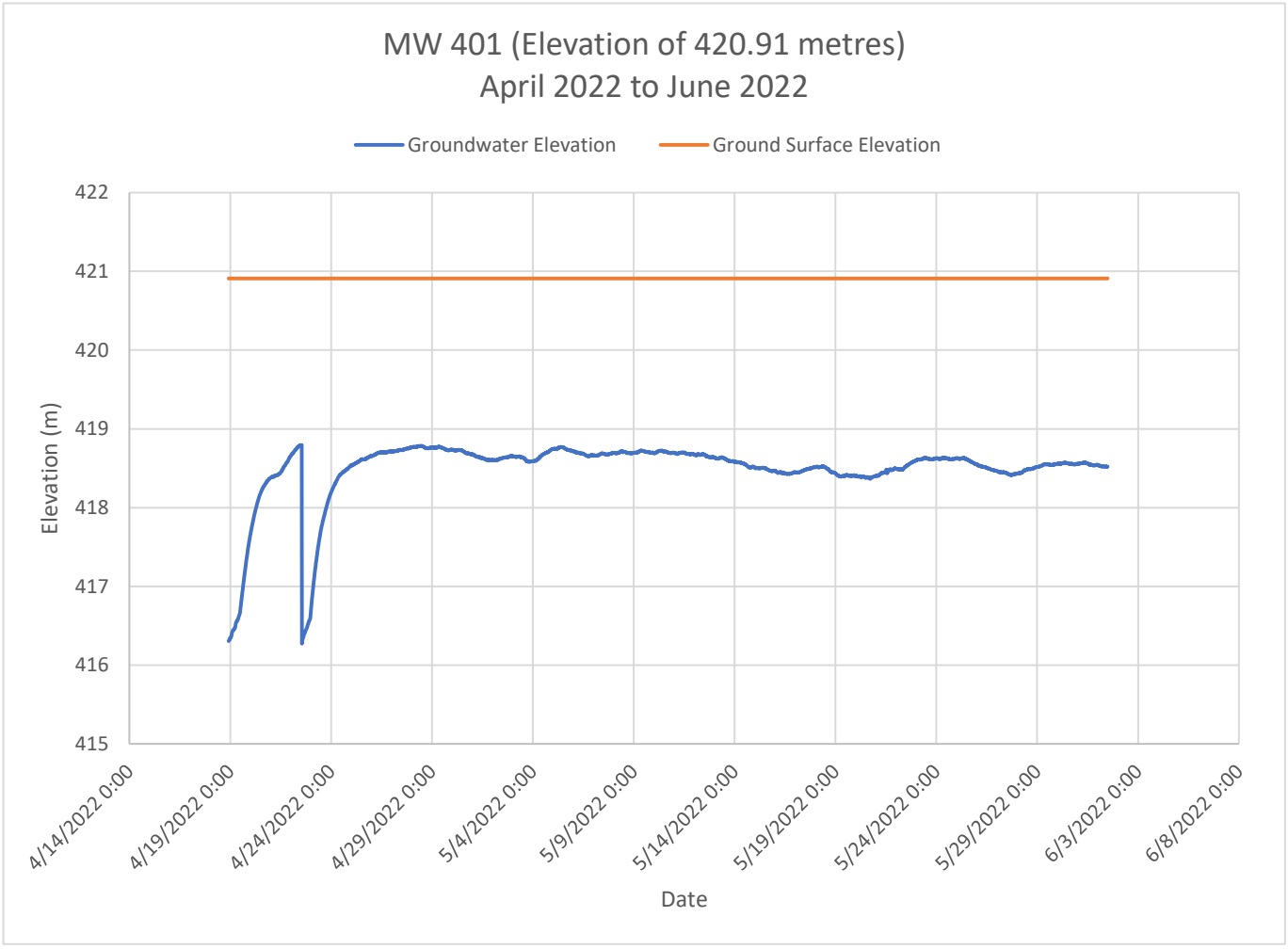

MW 401 (Elevation of 420.91 metres)
April 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
422
421
420
419
418
417
416
415
4/14/2022 0:00
4/19/2022 0:00
4/24/2022 0:00
4/29/2022 0:00
5/4/2022 0:00
5/9/2022 0:00
5/14/2022 0:00
5/19/2022 0:00
5/24/2022 0:00
5/29/2022 0:00
6/3/2022 0:00
6/8/2022 0:00
Date

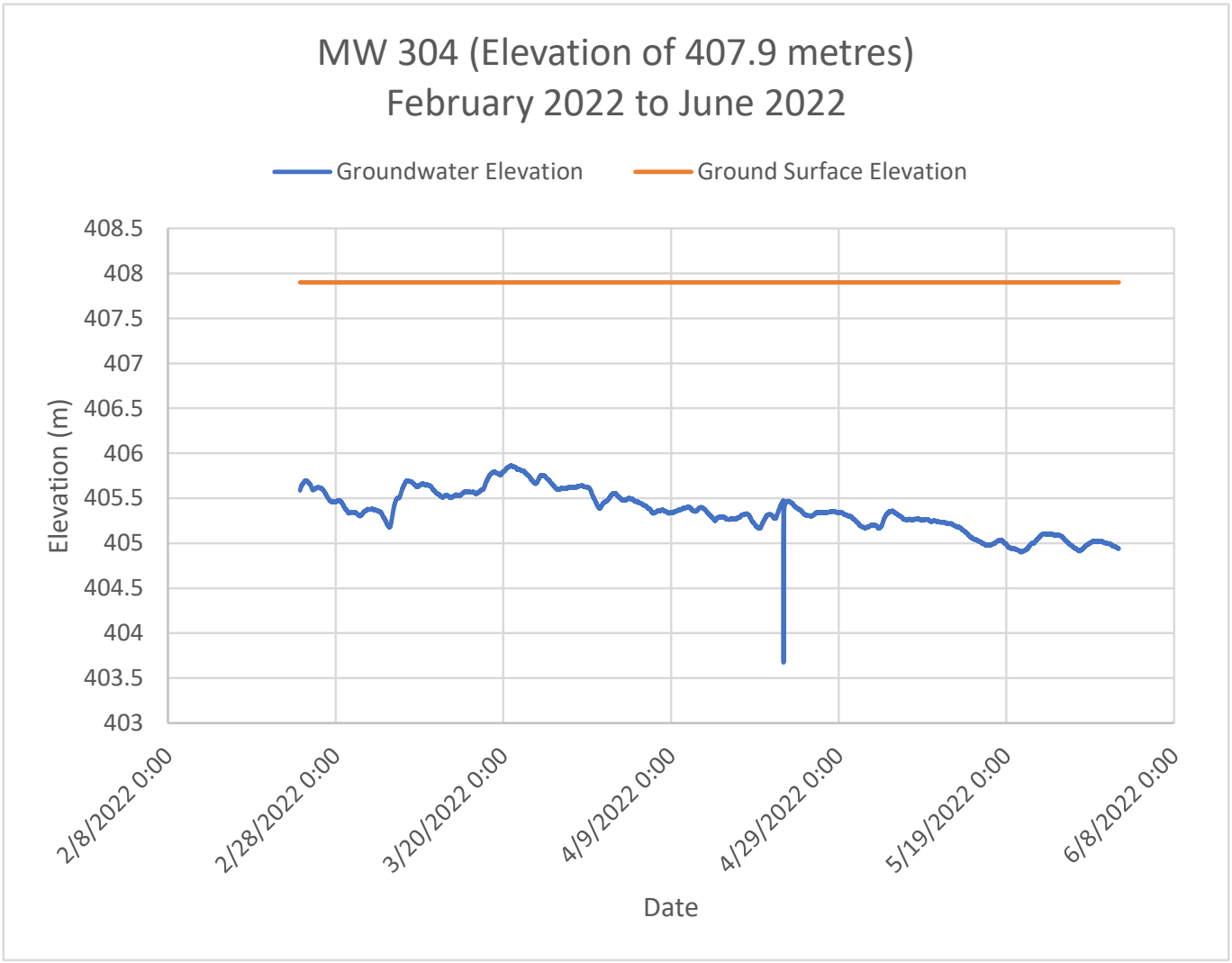

MW 401 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
421.50
421.00
420.50
420.00
419.50
419.00
418.50
418.00
417.50
417.00
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date


MW 204 (Elevation of 409.57 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
410
409.5
409
408.5
408
407.5
407
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date


MW 205 (Elevation of 412.99 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
413.5
413
412.5
412
411.5
411
410.5
410
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

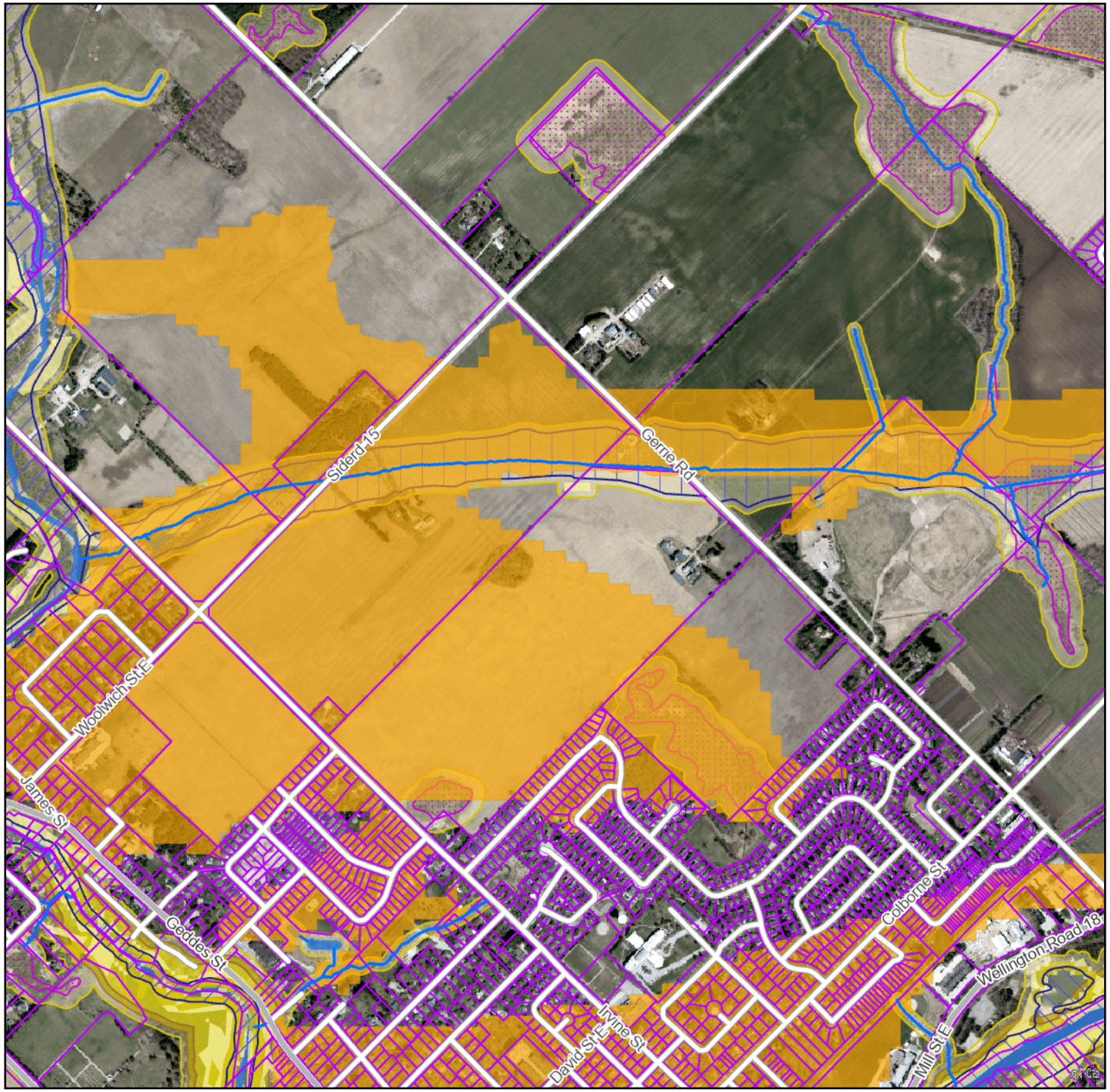

MW 206 (Elevation of 412.88 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date


MW 401 (Elevation of 420.91 metres)
April 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
422
421
420
419
418
417
416
415
4/14/2022 0:00
4/19/2022 0:00
4/24/2022 0:00
4/29/2022 0:00
5/4/2022 0:00
5/9/2022 0:00
5/14/2022 0:00
5/19/2022 0:00
5/24/2022 0:00
5/29/2022 0:00
6/3/2022 0:00
6/8/2022 0:00
Date


MW 304 (Elevation of 407.9 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
408.5
408
407.5
407
406.5
406
405.5
405
404.5
404
403.5
403
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

Appendix E

Source Water Protection Plan Mapping (GRCA)



Map Centre (X,Y): 545977.68, 4838619.67 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)

Grand River Conservation Authority

Date: Jan 31, 2025

Elora Sands/Keating Lands - SGRA Mapping

Legend

- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- Signif. GW Recharge - Tier 2 (GRCA)

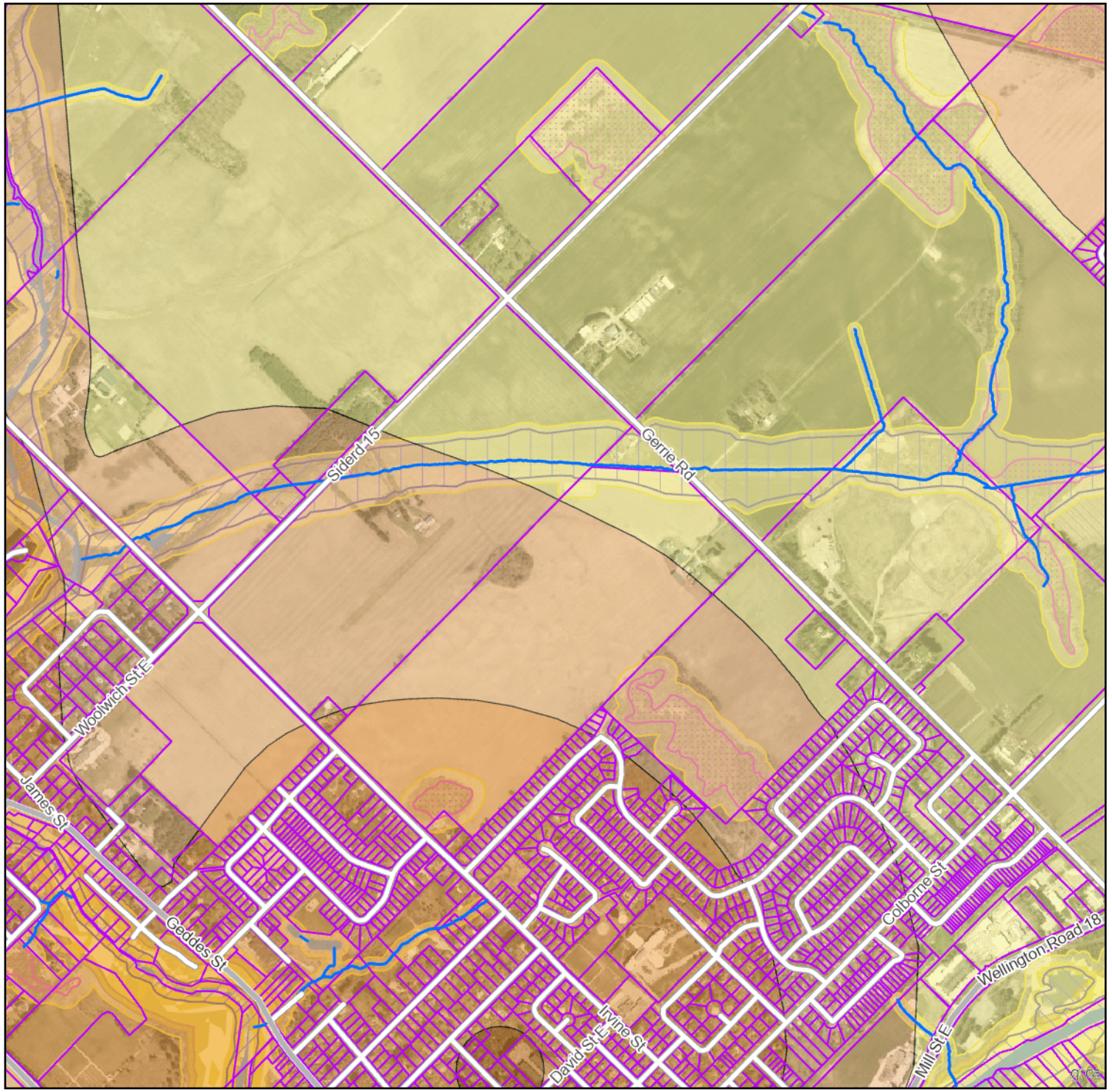
Copyright Grand River Conservation Authority, 2025.

Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend. See Sources and Citations for details.

Scale 1:12,880

NAD83 UTM zone 17 (EPSG:26917)

N



Grand River Conservation Authority

Date: Jan 31, 2025

Elora Sands/Keating Lands - WHPA Mapping

Legend

- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- WHPA-Wellhead Protection Area (GRCA)
  - WHPA-A
  - WHPA-B
  - WHPA-C
  - WHPA-D

Copyright Grand River Conservation Authority, 2025.

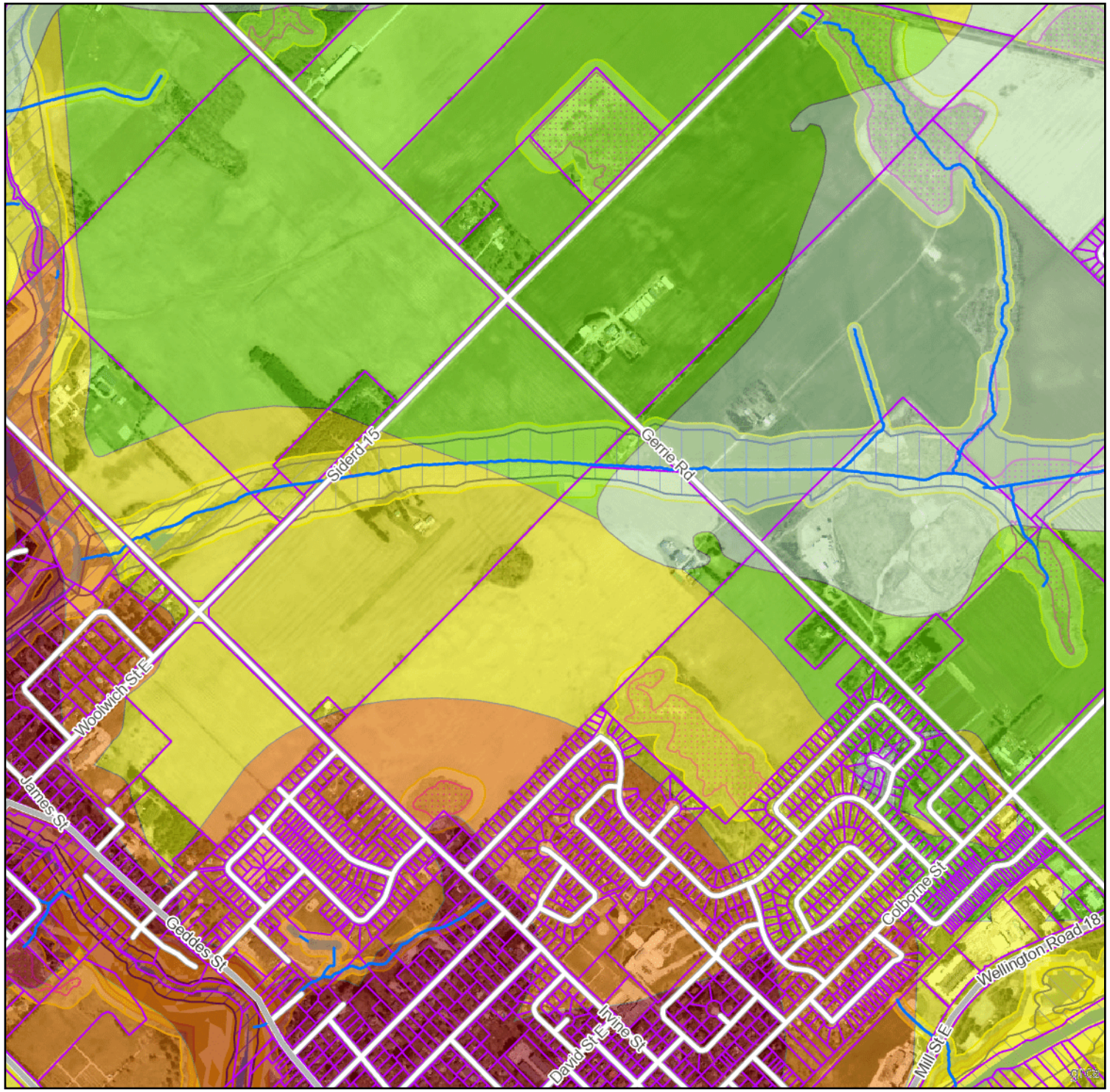
Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend. See Sources and Citations for details.

Scale 1:12,880

NAD83 UTM zone 17 (EPSG:26917)

Map Centre (X,Y): 545977.68, 4838619.67 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)



Grand River Conservation Authority

Date: Jan 31, 2025

Elora Sands/Keating Lands - WHPA Vulnerability

Legend

- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- WHPA Vulnerability (GRCA)
  - 10
  - 8
  - 6
  - 4
  - 2

Copyright Grand River Conservation Authority, 2025.

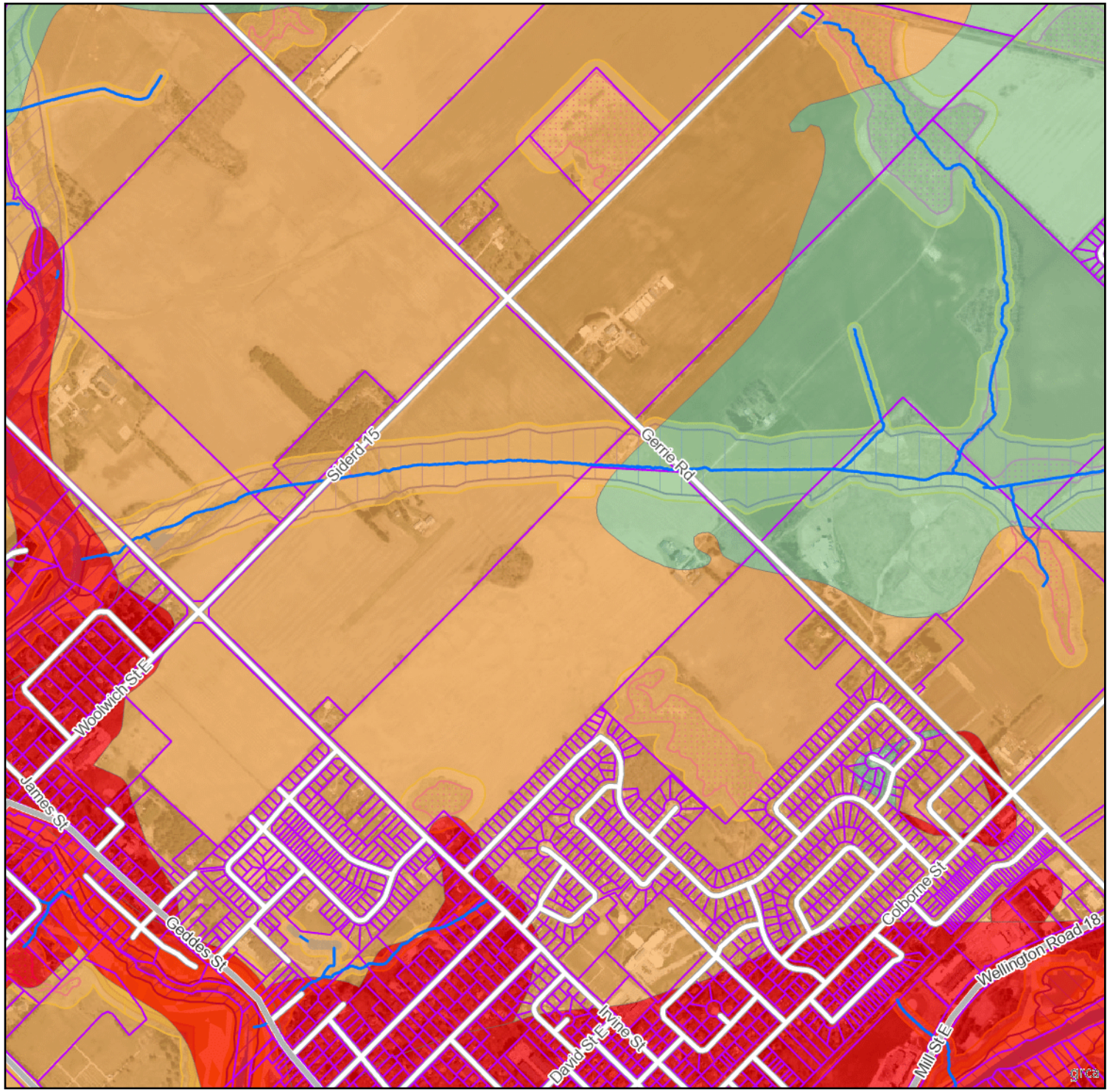
Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend. See Sources and Citations for details.

Scale 1:12,880

NAD83 UTM zone 17 (EPSG:26917)

Map Centre (X,Y): 545977.68, 4838619.67 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)



Grand River Conservation Authority

Date: Jan 31, 2025

Elora Sands/Keating Lands - Intrinsic Vulnerability

Legend

- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- Intrinsic Vulnerability (GRCA)
  - H
  - M
  - L

Copyright Grand River Conservation Authority, 2025.

Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend. See Sources and Citations for details.

Scale 1:12,880

NAD83 UTM zone 17 (EPSG:26917)

Map Centre (X,Y): 545977.68, 4838619.67 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)

Terra-Dynamics inc.
432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

March 6, 2025

Cachet Developments
c/o Brendan Walton, P.Eng.
361 Connie Crescent, Suite 200
Concord, ON L4K 5R2

Re: Source Water Protection Due Diligence Review, Elora Sands, 7581 Sideroad 15 (SR15), and Keating Lands (Part of Lot 17, Concession 12), Salem (Elora), ON

Dear Mr. Walton,

1.0 Introduction, Purpose and Background Information

Terra-Dynamics Inc. (Terra-Dynamics) respectfully submits this source water protection due diligence review of the 39.2 hectares of the Elora Sands property at 7581 Sideroad 15 (SR15), and the 38.7 hectares of the adjacent Keating Lands, Part of Lot 17, Concession 12, Elora (Salem), Township of Centre Wellington, County of Wellington, Ontario (Site). It is our understanding that residential development is proposed for the Site and will be serviced by municipal water and sewage (Malone Given Parsons Ltd., 2024).

The purpose of this Source Water Protection due diligence review is to advise Cachet Developments of future site development limitations with respect to addressing source water protection policies or/and related requirements. It is our understanding that the lands have been historically used for agriculture, e.g. corn, soybeans and pasture and corn.

The Site is currently outside of the existing Settlement Area boundary outlined in the Centre Wellington Official Plan, but it is our understanding that an application may be made to bring the Site into the Settlement Area.

2.0 Scope of Work

A background review of available information was completed that included, but was not limited to:

1. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps, including mapping of tile drainage, municipal drains and soil types.

2. Ontario Geological Survey (OGS) surficial geology and Aggregate Resources Inventory.

3. Consultant reports (e.g. Soil-Mat, Beacon, MTE, Waterloo Geoscience and GM Blue Plan);

4. Ministry of the Environment, Conservation and Parks, Source Protection Information Atlas.

5. Grand River Source Water Protection Area Source Water Protection datasets and reporting, including vulnerable area mapping (e.g. wellhead protection areas and significant groundwater recharge areas.

6. Liaison with Wellington Source Water Protection (Funk, 2025); and

7. Wellington County Official Plan (2024) and Centre Wellington Official Plan (2005).

3.0 Physical Setting Summary

3.1 Surficial Geology

The surficial geology of the Site has been regionally mapped as primarily gravel (59%) and sand (21%) with some sandy silt to silty sand diamicton (20%) (i.e. till) (Ontario Geological Survey (OGS), 2003). The OGS have also mapped much of the Site as a '*selected sand and gravel resource area of primary significance*' with 7 to 14 metres thickness coarse aggregate based upon water well data (OGS, 1999). This significance is recognized in the Centre Wellington Official Plan in Schedule C - Sand and Gravel Resources (Township of Centre Wellington, 2005). However the regional characterization appears to largely over-estimate the amount of high-permeable materials on-site, this is discussed below.

3.1.1 Elora Sands Property

The surficial geology of the Elora Sands property has been regionally mapped as primarily gravel (49%) and sand (38%) with some sandy silt to silty sand diamicton (13%) (i.e. till) (OGS, 2003). However, Site level borehole investigations of the Elora Sands property by Soil-Mat Engineers & Consultants Ltd. (2022) have proven that the regional mapping does not reflect actual site conditions. For example, the fourteen (14) boreholes completed at the Elora Sands property have delineated no gravel at-surface, and the areas of sand (~33% of the Site) are generally limited to between 1 and 2 metres thick in the northwest (i.e. BH006 and MW401 with sand thicknesses of 1.3 m and 1.6 m, respectively), and central portions of the Site (i.e. BH003 and MW201 with sand thicknesses of 1.7 m and 2.2 m, respectively), although at MW205 the sand thickness was 6.1 m (Drawing No.1, Soil-Mat, 2022).

3.1.1 Keating Lands

A borehole investigation southeast of the Keating Lands also suggests much less permeable/high recharge materials than regionally mapped (GM Blue Plan Engineering, 2023).

3.2 Groundwater Recharge

Groundwater recharge rates have been recently modelled as part of the Centre Wellington Tier Three Water Budget Risk Assessment – Risk Assessment Report (Matrix Solutions Inc., 2020) (Map 1, Figure 5). The modelled groundwater recharge rates are largely a reflection of the regional surficial geological mapping, with 60% of the Site modelled as between 300 and 500 mm/year or greater, i.e. equivalent to coarse sand or gravel (MECP, 1995).

These modelled values appear to include over-estimates for recharge at the Site, as much lower permeability soils have been identified based upon the borehole investigations completed by Soil-Mat Engineers & Consultants Ltd (2022). For example, in the central portion of the Elora Sands at borehole BH003 and MW202, clayey to sandy silt soils were identified (e.g. calculated infiltration rates of <10 mm/hour) and none of the regionally mapped gravel was identified (Drawing No. 1). High infiltration rates have been calculated for some boreholes, e.g. 201, 203 and 205 (50 mm/hour or greater).

3.3 Surface Water

The watercourse crossing the Site, the Nichol Drain (or Municipal Drain No.1), was classified by the Department of Fisheries and Oceans (DFO) in 2022 as "Type E", permanent flow, with a 'Spring' season restricted timing window (OMAFRA, 2025, Map 2). The Site north of the drain is mapped as tile-drained, likely installed about 1 metre below ground surface (OMAFRA, 2007), and tile outlets to the drain were observed by Beacon Environmental (2025). Past research suggests tile-drainage may capture between 10 and 15% of infiltration (Mulhern, 2008). The Nichol Drain outlets to Irvine Creek west of the Site.

Beacon Environmental have indicated the "*Nichol Drain should be considered to have coldwater fishery potential and be classified as a coldwater stream for construction and stormwater management perspective. Watercress was visible during the Beacon investigation, supporting this designation*" (Beacon Environmental, 2025). The drain at the Site has been previously mapped by the GRCA as a groundwater discharge area (GRCA, 2024) since the regional water table is higher in elevation than the drain. Groundwater levels at MW004 appear to support the local water table being higher in elevation than the drain (Drawing No.1).

The GRCA have regionally mapped the Site as about 75% within the Nichol Drain catchment and 25% towards the Queen Street Tributary with a small portion along the eastern boundary towards the southeast (GRCA, 2017). The subcatchment divides have been refined via a Site topographic survey to show a slightly larger area draining towards the Queen Street Tributary and not towards the southeast, under-predevelopment conditions (MTE, 2025).

3.4 Southwest Unevaluated Wetland – Keating Lands

The Ministry of Natural Resources and Forestry (MNRF) and GRCA have regionally mapped a 0.78 ha unevaluated wetland in the southern part of the Site adjacent Irvine Street. This wetland vegetation is presented as part of the Core Greenlands within the Wellington County Official Plan (2024). This wetland vegetation has not been staked with the GRCA, but is scheduled for staking in 2025.

Beacon Environmental have identified the wetland vegetation as consisting of primarily Willow Mineral Thicket Swamp and Red-osier Mineral Thicket Swamp, with some Fresh-Moist Lowland Deciduous Forest adjacent and an inclusion of Mineral Shallow Marsh within the swamp with standing water (Beacon Environmental, 2025).

This unevaluated wetland is located on the margin of regionally mapped gravel and sandy silt/silty sand till (OGS, 2003). Geology from nearby Elora Meadows boreholes MW18 and MW19 recorded sand on silty sand till with groundwater levels as high as within 1 m of surface (Waterloo Geoscience, 2005). It is possible the wetland is an area of slower groundwater recharge as GRCA has regionally mapped a weak

downwards vertical gradient (GRCA, 2024). The wetland vegetation does not appear to have a connection to a watercourse, i.e. it may be supplied water by only precipitation and overland runoff.

3.5 Township of Centre Wellington Well Supply Municipal Well E1

Elora municipal well E1 is located 535 m south-southeast of the Site and 860 m south-southeast of the Elora Sands property (Map 3, Figure 8, Matrix Solutions Inc., 2017). This well is constructed to take water from the bedrock aquifer and is 130 metres deep with casing to 19.8 metres below ground surface (Map 4, Figure 13, Matrix Solutions Inc., 2017). The well produced on average 47% of the Elora municipal supply in 2018 (Matrix Solutions Inc., 2020).

The bedrock aquifer beneath the Site has been most recently regionally mapped as having primarily low vulnerability (vulnerability scores of 2, 4 and 6), with a portion of the southern area of the Site mapped as 8 (medium vulnerability score), and a very small portion mapped as 10 (high) (Map 5, Figure 6-29, Grand River Source Protection Committee, 2022a, and Map 5b, MECP, 2025).

4.0 Source Water Protection

The Site is within the Grand River Source Protection Area. The Grand River Source Protection Committee was responsible for mapping four types of vulnerable areas within the Grand River Source Protection Area: (i) wellhead protection areas, (ii) intake protection zones, (iii) highly vulnerable aquifers and (iv) significant groundwater recharge areas. Two of these types of vulnerable areas are mapped at the Site: (1) wellhead protection areas and (2) significant groundwater recharges areas (MECP, 2025).

Wellhead protection areas (WHPAs) can include different zones for water quality protection of a groundwater supply. These different zones are based largely upon the expected travel time of contaminants to the water supply after they enter the aquifer (Table 1, Figure 1 – Illustration of WHPA Zones, MECP, 2006). These zones were mapped using a groundwater flow model to include both areas upgradient of the well as well as cross- and down-gradient as the well captures water from these areas.

Table 1 –Water Quality Well Head Protection Areas (WHPA) Details (MECP, 2006)

WHPA	Description
A	100 m radius
B	2 year Time of Travel
C	2 to 5 year Time of Travel
D	5 to 25 year Time of Travel

WHPAs can also include areas for water quantity protection, called WHPA Q1 and/or Q2. WHPA-Q1 is delineated based upon a combination of the cone of influence of each pumping well and WHPA-Q2 for land areas where reductions in recharge have the potential to have a measurable impact on the municipal wells (Matrix Solutions Inc., 2020).

Significant groundwater recharge areas (SGRAs) were also mapped at the Site, as areas regionally having groundwater recharge 15% above the average watershed rate. The average watershed recharge rate was calculated as 176 mm/year, for an SGRA criterion of greater than 202 mm/year (GRCA, 2023). This mapping was completed as part of the Tier 2 Water Budget Assessment derived from previous GRCA

Hydrologic Response Unit modelling using the Guelph-All-Weather-Storm-Event-Runoff (GAWSER) model which used regional surficial geologic mapping (GRCA, 2023). However, as mentioned in Section 3.2, an analysis of local borehole results is expected to reduce the amount of SGRAs at the Site.

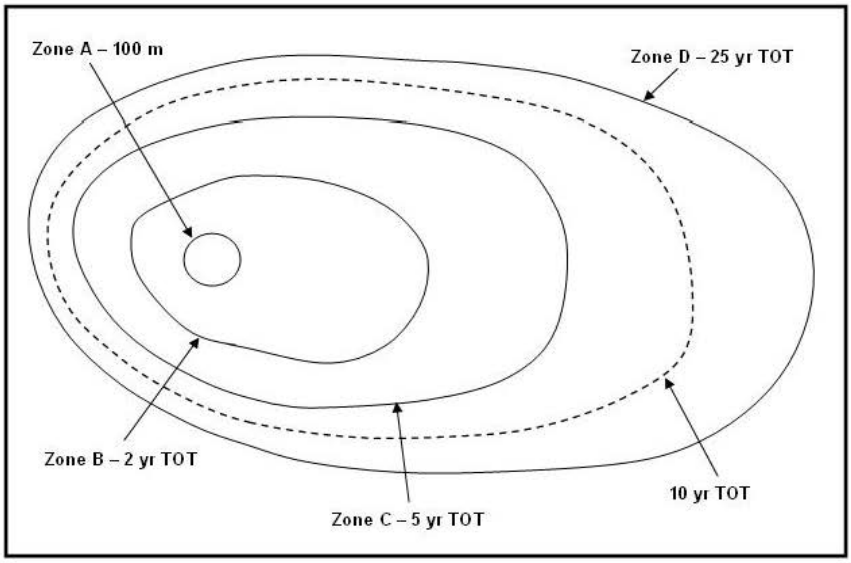


Figure 1 – Illustration of WHPA Zones (MECP, 2006)

4.1 Wellhead Protection Areas

A series of WHPAs for the nearby municipal well E1 extend onto the Site (Map 6, Figure 7.1, Grand River Source Protection Committee, 2022b). The areal coverage and location of these WHPAs is approximated below (Tables 2a and 2b).

A WHPA-Q was also delineated for the Centre Wellington municipal groundwater supplies (Map 7, Figure 11, Matrix Solutions Inc., 2020) as "*the combined area that is the cone of influence of the well… plus the whole of the cones of influence of all other wells… that intersect that area…the WHPA-Q1 and WHPA-Q2 are coincident*" (Matrix Solutions Inc., 2020).

Significant water quality threat policies exist for the WHPA-B and WHPA-C areas that must be conformed to, or complied with (Section 4.3), e.g. regarding dense non-aqueous phase liquids (DNAPLs). Examples of DNAPLs include metal degreasers, paint removers and brake fluid. However, the current Grand River Source Protection Plan does not include policies for moderate and low threats.

With respect to significant water quantity threats, all "…*future areas of recharge reduction (due to land use development within this policy area)* (i.e. WHPA-Q) *are classified as Significant water quantity threats …*" (Matrix Solutions Inc., 2020). This preliminary designation was because "…*the potential impact of stormwater management measures and low impact development techniques was not considered when estimating recharge reductions on future land development areas*" (Matrix Solutions Inc., 2020). For example, southwest lands at 75 Woolwich Street East (Elora, Ontario), were mapped as a '*Groundwater Recharge Reduction Threat*" (Map 7, Figure 11, Matrix Solutions Inc., 2020).

Table 2a – Site WHPA Summary Details (Grand River Source Protection Committee, 2022b)

WHPA	Area (hectares)	Percent of Site	On-site Location	Vulnerability Score	Significant Threat Policy Categories
B	<0.1	<0.2%	Southern	10	Waste Disposal, Sewage Systems, Agricultural Source Material, Non-Agricultural Source Material, Commercial Fertilizer, Pesticide, Road Salt, Storage of Snow, Fuel, DNAPLs, Organic Solvents, Aircraft De-icing, Livestock Area, Oil Pipelines
	10.9	14%	Southern	8	Waste Disposal, Sewage Systems DNAPLs
C	47	60%	Central	6/4/2	DNAPLs
D	20	26%	North/ Northeast	4/2	None
Q1/Q2	Entire Site	100%	NA	NA	To be confirmed

Table 2b – Elora Sands WHPA Summary Details (Grand River Source Protection Committee, 2022b)

WHPA	Area (hectares)	Percent of Site	On-site Location	Vulnerability Score	Significant Threat Policy Categories
B	0.03	<0.1%	South	8	Waste Disposal, Sewage Systems DNAPLs
C	26.5	68%	Southwest	6	DNAPLs
D	12.7	32%	Northeast	4	None
Q1/Q2	Entire Site	100%	NA	NA	To be confirmed

4.2 Significant Groundwater Recharge Areas (SGRAs) Mapping

SGRAs have been regionally mapped to cover about 83% of the Site (Map 8, MECP, 2025). However, this is based upon modelled recharge rates that used regional surficial geologic mapping that appears to over-estimate SGRAs at the Site (Section 3.1). AquaResource Inc. (2009) acknowledge the limitation of regional SGRA modelling and provide the following regarding the SGRA mapping:

> "*Caution also applies to the use of SGRAs, which are delineated using regional estimates of recharge… For use at a site-specific scale, they should be refined to take into account a more detailed hydrogeological characterization.*"

4.3 Source Water Protection Policies

Significant Threat Source Protection Plan policies for consideration include water quality and water quantity. Acronyms used in this section include: WC – Wellington County, CW – Centre Wellington, MC – Must Conform, CWA – Clean Water Act, LID – Low Impact Development and ICA – Issue Contributing Area, TCE – trichloroethylene and EPA – Environmental Protection Act.

The Significant Water Quality Threat policies are presented from greatest to least areal coverage of the Site, i.e. (i) WHPA-C, (ii) WHPA-B vulnerability score of 8, and (iii) WHPA-B vulnerability score of 10.

4.3.1 Significant Water Quality Threats (WHPA-C and WHPA-B vulnerability score of 8)

Within the area of the Site mapped as WHPA-C (or ~60% of the Site), one significant water quality threat may apply, WC-CW-16.3, this policy is listed below (Table 3) (Grand River Source Protection Committee, 2022b). This policy is not expected to exert a constraint on residential development of the Site, as it is intended to inform industrial, commercial, institutional or agricultural activities with respect to the handling and storage of a DNAPL. However, this is expected to be reviewed by the Risk Management Official to determine if a Risk Management Plan is required, and in some cases an Education and Outreach Program for residents will be required.

Table 3 – Relevant DNAPL Policy (Grand River Source Protection Committee, 2022b**)**

Policy	Text
WC-CW-16.3	To ensure any Future handling and storage of a dense non-aqueous phase liquid (DNAPL) for industrial, commercial, institutional or agricultural purposes within a WHPA-B, C or TCE ICA, never becomes a significant drinking water threat, where this activity would be a significant drinking water threat, this activity shall be designated for the purpose of Section 58 of the CWA and a Risk Management Plan shall be required where the following apply: a. Any quantity of DNAPL in a WHPA-B with a vulnerability score of 10, including within an ICA for trichloroethylene; or b. Any quantity of the following chlorinated solvents in a WHPA-B or WHPA-C, with a vulnerability score < 10, including within an ICA for TCE, or within a WHPA-D in an ICA for TCE: • Dioxane-1,4 • Tetrachloroethylene (PCE), TCE or another DNAPL that could degrade to TCE • Vinyl chloride or another DNAPL that could degrade to vinyl chloride; or c. 25 Litres or greater of Poly Aromatic Hydrocarbons (PAHs) in a WHPA-B or WHPA-C, with a vulnerability score < 10, including within an ICA for TCE, or within a WHPA-D in an ICA for TCE.

Within the area of the Site mapped as WHPA-B vulnerability score 8 (approximately 14%), three significant water quality threats may apply, WC-CW-16.3 (already discussed above) as well as policies WC-MC-2.3 and WC-MC-3.4, and these two additional policies are listed below (Table 4). It is not expected that these policies will exert constraints on residential development of the Site as neither a waste management disposal site (WC-MC-2.3) nor a sewage treatment plant (WC-MC-3.4) are proposed.

Table 4 – Waste Disposal and Sewage System Relevant Policies
(Grand River Source Protection Committee, 2022b**)**

Policy	Text
WC-MC-2.3	To ensure the establishment, operation or maintenance of a Future waste disposal site within the meaning of Part V of the *EPA* that is subject to an Environmental Compliance Approval, never becomes a significant drinking water threat, where this activity would be a significant drinking water threat, the MECP shall prohibit these activities within the Environmental Compliance Approvals process.

Policy	Text
WC-MC-3.4	To ensure the establishment of Future sewage treatment plants with effluent and/or bypass discharge or Future sewage treatment plants with sewage storage tanks never becomes a significant drinking water threat, where these activities would be a significant drinking water threat, the MECP shall prohibit these activities within the Environmental Compliance Approvals process. This policy does not apply to the expansion, modification, optimization, re-rating, operation, maintenance or replacement of Existing sewage treatment plants.

Each Significant Water Quality Threat Source Protection Plan policy has a legal effect, and these are listed below in Table 5.

Table 5 – Legal Effect of Water Quality Policies (Grand River Source Protection Committee, 2022b**)**

Policy	Legal Effect
WC-CW-16.3	Section 58 (Risk Management Plans) of the Clean Water Act
WC-MC-2.3	Affects EPA and Ontario Water Resources Act Prescribed Instrument Decisions (e.g. Stormwater management ECA approvals)
WC-MC-3.4	

4.3.2 Significant Water Quantity Threats (WHPA-B vulnerability score of 10)

Within the area of the Site mapped as WHPA-B and a vulnerability score of 10 (or <0.2% of the Site, Map 5b), there are many significant water quality threat policies listed for consideration however many will not require consideration (Grand River Source Protection Committee, 2022b).

For example, the current development plan proposes a southernmost stormwater management facility that covers the WHPA-B with a vulnerability score of 10. Consequently, additional groundwater protection measures will be required by the MECP for the Environmental Compliance Approval (Policy WC-MC-3.7), as well as some Risk Management Plan component (Policy WC-CW-3.8), however these policies do not appear to include prohibition. Also, additional groundwater protection measures will be required for any sanitary sewers in this area by the MECP (WC-MC-3.5), however this policy also does not appear to include prohibition of sanitary sewers and the current design does not appear to have any in this area (MTE, 2025).

The policies discussed in Section 4.3.1 also apply to the small area of WHPA-B with a vulnerability score of 10.

There are also a number of other policies that may apply to this small area regarding road salt, snow storage and fuel storage and handling, e.g. during the construction phase. However, these 'threats' are likely to be managed as part of the stormwater ECA for the built-out development.

However, many of the policies are not expected to affect the proposed development because the water quality threats will not be occurring, e.g. waste disposal sites, sewage holding tanks, sewage treatment plant discharge, industrial effluent, application of agricultural source material, storage of agricultural source material, application of non-agricultural source material, handling and storage of non-agricultural source materials, application of commercial fertilizer to land, handling and storage of commercial fertilizer, application of pesticide, handling and storage of pesticides, the handling and storage of an

organic solvent. de-icing aircraft chemical runoff, livestock grazing/animal yards and a liquid hydrocarbon pipeline.

4.3.3 Significant Water Quantity Threats

There are three Significant Water Quantity Source Protection Plan policies that apply to residential development of the Site: (i) WC-MC-23.2, (ii) WC-MC-23.3 and (iii) WC-MC-23.5. These are listed below from the Source Protection Plan in Table 6.

Table 6 – Relevant Water Quantity Policies (Grand River Source Protection Committee, 2022b**)**

Policy	Text
Common introductory text	To ensure that any Recharge Reducing Activity never becomes a significant drinking water threat, where this activity would be a significant drinking water threat as prescribed by the CWA
WC-MC-23.2	…the MECP should, during any pre-submission consultation for Environmental Compliance Approvals for Stormwater Management Facilities and / or Sewage Works, encourage design and implementation measures for the maintenance of groundwater recharge functions including but not limited to LID, minimizing impervious surfaces, and lot level infiltration. The MECP shall issue Environmental Compliance Approvals for Stormwater Management Facilities and / or Sewage Works that, where appropriate, incorporate conditions that address groundwater recharge considerations. In addition, the MECP, where appropriate, shall consider incorporating conditions in the Environmental Compliance Approvals to address the proper functioning of groundwater recharge measures including, but not limited to, conditions requiring or related to operations, inspection and maintenance of the Stormwater Management Facilities and / or Sewage Works, groundwater or surface water monitoring related to groundwater recharge, and documentation including manuals and maintenance records. For Stormwater Management Facilities and / or Sewage Works located within the WHPA-Q in a Chloride, Sodium or Nitrate ICA, the MECP shall consider conditions that require best management practices that address how recharge will be maintained and water quality will be protected from application and storage of winter maintenance materials including Salt.
WC-MC-23.3	… the County, as the Planning Approval Authority, in consultation with the Municipalities, shall only approve settlement area expansions within a WHPA-Q as part of a municipal comprehensive review or as otherwise provided by the Provincial Growth Plan for the Greater Golden Horseshoe, where it can be adequately demonstrated that recharge functions can be maintained or improved on lands designated as Significant Groundwater Recharge Areas within a WHPA-Q.
WC-MC-23.5	… the Planning Approval Authority shall require that all site plan, subdivision and vacant land condominium applications to facilitate Major Development for new residential, commercial, industrial and institutional uses provide a water balance assessment for the proposed development which addresses each of the following requirements:

Policy	Text
	a. maintain pre-development recharge to the greatest extent feasible through best management practices such as LID, minimizing impervious surfaces, and lot level infiltration; b. where pre-development recharge cannot be maintained on site, implement and maximize off-site recharge enhancement (within the same WHPA-Q) to compensate for any predicted loss of recharge from the development; and c. within a WHPA-Q in a Chloride, Sodium or Nitrate ICA, the water balance assessment must consider water quality when recommending best management practices and address how recharge will be maintained and water quality will be protected including consideration of how water quality will be protected from application and storage of winter maintenance materials including Salt. The Planning Approval Authority shall use its discretion to implement the requirements of this policy to the extent feasible and practicable given the nature of the proposed development, specific circumstances of a site and off-site recharge opportunities.

However, as the Site is not located in a Chloride, Sodium or Nitrate ICA, consequently those portions of these policies should not apply.

Each Significant Water Quantity Threat Source Protection Plan policy has a legal effect, and these are listed below in Table 7.

Table 7 – Legal Effect of Water Quantity Policies (Grand River Source Protection Committee, 2022b**)**

Policy	Legal Effect
WC-MC-23.2	Affects EPA and Ontario Water Resources Act Prescribed Instrument Decisions (e.g. Stormwater management ECA approvals)
WC-MC-23.3	Affects decisions under the Planning Act and Condominium Act and Imposes obligation on Municipality and Source Protection Authority
WC-MC-23.5	

5.0 Discussion

For expansion of the Settlement Area (and subsequent development of the Site), it will be required to adequately demonstrate that "*recharge functions can be maintained or improved on lands designated as Significant Groundwater Recharge Areas within a WHPA-Q*" (Policy WC-MC-23.3). However, as mentioned in Section 4.2, the amount of SGRAs at the Site may be reduced upon further analysis.

The demonstration of maintenance, or improvement of recharge, is expected to be accomplished through a water balance assessment (and Stormwater Management Plan) that maintains "…*pre-development recharge to the greatest extent feasible through best management practices such as LID, minimizing impervious surfaces, and lot level infiltration*…" (Policy WC-MC-23.5).

However, it is expected that Site development will also require maintenance of baseflow to the Nichol Drain including ecological function with respect to temperature control (CVC, 2012). This may require additional monitoring of the Nichol Drain.

In a somewhat similar proposed residential development that we assisted with, pre-development recharge was primarily maintained through a below grade infiltration facility to allow for centralized infiltration.

Source Protection Plan policies to prevent significant water quality threats are not anticipated to prohibit the development plan but will require some additional coordination to address potential concerns with the MECP and the Source Water Protection Risk Management Officer.

The unevaluated wetland at the southern end of the Site is presumed to be maintained by a combination of precipitation and runoff, however site characterization would be required to confirm, e.g. wetland hydroperiod monitoring, borehole, monitoring well and measurement of the vertical groundwater gradient.

6.0 Conclusions and Recommendations

The following conclusions are provided:

1. Site boreholes have identified less permeable at-surface soils than regionally mapped and used for regional water budget modelling.

2. Recently modelled GRCA Tier 3 Water Budget recharge rates appear to over-estimate actual Site recharge, and historic GRCA Tier 2 Water Budget recharge rates appear to over-estimate the amount of Significant Groundwater Recharge Areas at the Site.

3. The Site primarily drains to the Nichol Drain, which has permanent flow, a coldwater thermal classification and indicators of groundwater discharge.

4. Tile-drainage is mapped in the northeast portion of the Site with some discharge to the Nichol Drain. This tile-drainage may have a role in sustaining the drain flow and temperature regime.

5. The bedrock aquifer beneath the Site has been primarily mapped as having low vulnerability with a portion of the Site mapped as medium and a very small portion mapped as highly vulnerable.

6. The Site overlies Wellhead Protection Areas (WHPAs) for Municipal Well E1 located about 535 m south-southeast. The WHPAs include both quality protection zones (WHPA-B, WHPA-C and WHPA-D) and a quantity protection zone (WHPA-Q, entire Site).

7. Significant Groundwater Recharge Areas (SGRAs) have been regionally mapped over 83% of the Site and are expected to decline in extent following analyses of local geologic conditions.

8. The Site is considered a significant water quantity threat to the municipal groundwater supplies if groundwater recharge is reduced.

9. Source Water Protection Water Quality Threat Policies are not expected to prevent residential development of the Site, however additional coordination with the MECP and the Source Water Protection Risk Management Officer will be required, e.g. with respect to the southernmost stormwater management facility.

10. Source Water Protection Water Quantity Threat Policies are expected to require post-development groundwater recharge at the Site to equal or exceed pre-development groundwater recharge rates. It is expected that the water management approach will require maintenance of groundwater discharge to the drain including coldwater temperature.

11. The unevaluated wetland may be maintained by a combination of precipitation and runoff but field characterization and analyses would be required to confirm.

The following recommendations are provided:

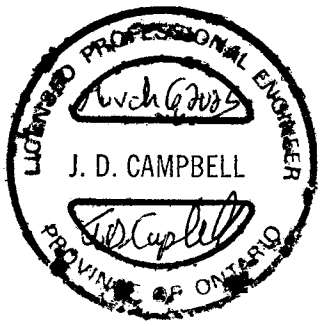
1. Project budgeting for residential development of the Site should include consideration for (a) further Site characterization (e.g. Nichol drain flow, level and temperature monitoring and Unevaluated wetland staff gauge, borehole and monitoring well), (b) analyses of local geologic conditions and GRCA modelling to complete the water balance assessment and refined SGRA mapping, and (c) design of Site infiltration measures.

2. Pre-consultation should be completed with the local government agencies (Wellington County, Centre Wellington, Grand River Conservation Authority and Wellington Source Water Protection) in order to scope the level of assessment required.

We trust this information is sufficient for your present needs. Please do not hesitate to contact us if you have any questions.

Yours truly,

TERRA-DYNAMICS INC.



Jayme D. Campbell, P. Eng.
Senior Water Resources Engineer

Attachments
Drawing No.1 – Elora Sands Borehole Location Plan
Map 1 – Land Use Change and Future Recharge
Map 2 – OMAFRA Municipal Drain and Tile-Drainage

Map 3 – Surficial Geology
Map 4 – Local Elora Cross Section C-C'
Map 5 – Centre Wellington Wellhead Protection Area Final Vulnerability
Map 5b – Bedrock Aquifer Vulnerability
Map 6 – County of Wellington, Centre Wellington Wells, Significant Drinking Water Threat Applicability
Map 7 – Water Quantity Threats
Map 8 – Significant Groundwater Recharge Areas

7.0 References

AquaResource Inc., 2009. Integrated Water Budget Report – Tier 2 Credit Valley Source Protection Area. Prepared for the Credit Valley Conservation Authority.

Beacon Environmental Limited, 2025. Environmental Impact Study, Elora Sands and Keating Lands, Township of Centre Wellington, Wellington County. Prepared for Cachet Developments.

Credit Valley Conservation, 2012. Stormwater Management Criteria.

Funk, K., 2025. Re: Threat #20 Policy Clarification, E-mail from Kim Funk (Source Protection Coordinator, Wellington Source Water Protection) to Jayme Campbell (Terra-Dynamics Inc.).

GM Blue Plan Engineering, 2023. Hydrogeological Study Ainley Farm Subdivision, Township of Centre Welling (Elora), James Keating Construction.

Grand River Conservation Authority (GRCA), 2024. Groundwater Discharge Area, Open Data.

Grand River Conservation Authority (GRCA), 2023. SWP Significant Groundwater Recharge Area – Tier 2.

Grand River Conservation Authority (GRCA), 2017. Subcatchment Basins, Open Data.

Grand River Source Protection Committee, 2022a. Approved Assessment Report, Grand River Source Protection Area.

Grand River Source Protection Committee, 2022b. Grand River Source Protection Plan, Volume II – Approved.

Malone Given Parsons Ltd., 2024. Concept Plan, Prepared for Elora Sands Development Inc.

Matrix Solutions Inc., 2020. Centre Wellington Tier Three Water Budget Final Risk Assessment Report. Prepared for: Grand River Conservation Authority.

Matrix Solutions Inc., 2017. Centre Wellington Scoped Tier Three Water Budget Assessment, Physical Characterization Report. Report Prepared for: Grand River Conservation Authority.

Ministry of the Environment, Conservation and Parks, 2025. Source Protection Information Atlas.

Ministry of the Environment, (Conservation and Parks), 2006. Draft Groundwater Module 3: Assessment Report.

Ministry of the Environment, (Conservation and Parks), 1995. MOEE Hydrogeological Technical Information Requirements for Land Development Applications.

MTE, 2025. Elora Sands/Keating Lands, Functional Servicing and Preliminary SWM Strategy Report.

Mulhern, M., 2008. Tile drains capture less water than expected, from Pigs, Pork & Progress.

Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2025. AgMaps.

Ontario Geological Survey (OGS), 2003. Surficial geology of southern Ontario. Miscellaneous Release Data – 128. Project Summary and Technical Document, 53 pp.

Ontario Geological Survey (OGS), 1999. Aggregate Resource Inventory of Wellington County, Aggregate Resources Inventory Paper 162, by Planning & Engineering Initiatives Ltd. and Staff of the Sedimentary Geoscience Section, Ontario Geological Survey.

Soil-Mat Engineers & Consultants Ltd., 2022. Preliminary Hydrogeological Assessment, Proposed Residential Development, Clayton and Elora Sands, Elora, Ontario.

Township of Centre Wellington, 2005 as amended. Municipal Official Plan.

Waterloo Geoscience Consultants Ltd., 2005. Hydrogeological Investigation, Elora Meadows Proposed Residential Development, Lots 17, Concession 11, Township of Centre Wellington, County of Wellington. Prepared for Black Shoemaker Robinson & Donaldson.

Wellington County, 2024. County of Wellington Official Plan.

LEGEND

- Borehole Location — BH#
- Monitoring Well Location — MW#
- Geological Cross Section Location

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301591-G.

2. Borehole and monitoring well locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Nichol Road 15
Elora, Ontario

Borehole Location Plan

Project No. SM 301591-G

Date: June 2022

Drawn: SW | Checked: IS

SM 301591-G Borehole Location Plan

Drawing No. 1

Easting (m)

541500 543000 544500 546000 547500 549000 550500 552000 553500

Northing (m)

4843500 4842000 4840500 4839000 4837500 4836000 4834500

TOWNSHIP OF MAPLETON

TOWNSHIP OF CENTRE WELLINGTON

SITE

F1 F2 F4 F5 F6 F7

E1 E3 E4

Fergus

Salem

Elora

Belwood Reservoir

Grand River

Irvine Creek

Carroll Creek

Swan Creek

Wellington 29 Road

Wellington 7 Road

Townline Eramosa Garafraxa

2nd Line

4th Line

6th Line

Sideroad 5

Sideroad 10

Sideroad 15

Sideroad 18

Sideroad 19

Sideroad 4

Sideroad 6 North

N

- Land Use Change
- Municipal Boundary
- Water Body
- Watercourse
- Highway
- Road
- Municipal Well

Future Groundwater Recharge (mm/yr)

- 0
- 0 < ... <= 75
- 75 <...<= 125
- 125 < ...<= 200
- 200 < ... <= 300
- 300 < ... <= 400
- 400 < ... <= 500
- > 500

Map 1

1:45,000 metres

500 0 500 1,000

NAD 1983 UTM Zone 17N

Reference: Data obtained from Grand River Conservation Authority (2017) and GeoBase® used under license. Contains information licensed under the Open Government Licence – Ontario.

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget Assessment - Risk Assessment Report

Land Use Change and Future Recharge

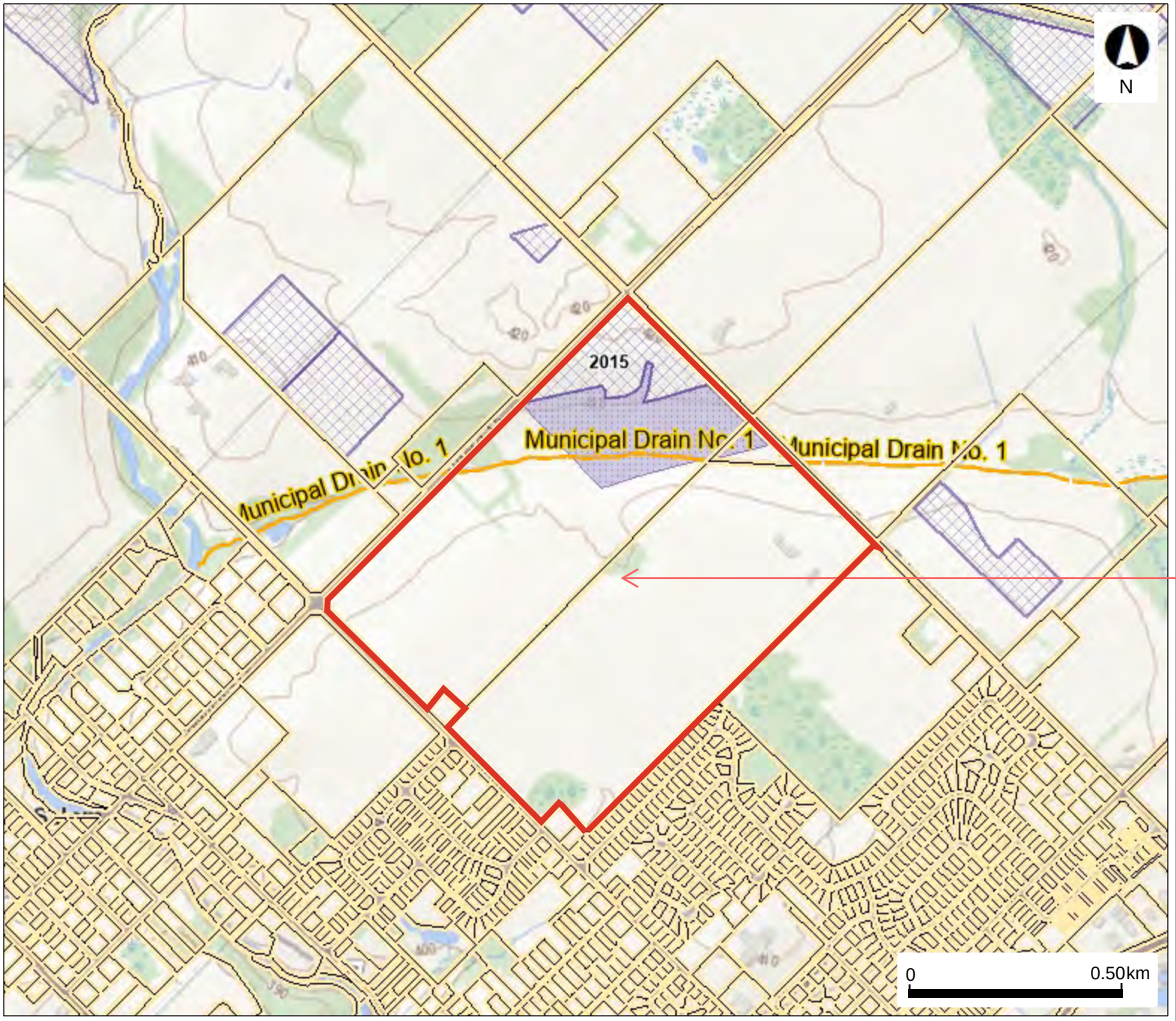
Date:	Project:	Submitter:	Reviewer:
October 2019	23876	J. Melchin	D. Van Vliet

Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.

Figure 5

I:\GrandRiver\CA\23876\FiguresandTables\T3\2019\Report\RiskAssessmentReport\Figure-5-Land_Use_Change_and_Future_Recharge.mxd - Tabloid_L - 02-Oct-19, 12:20 PM - imwright - TD005

OMAFRA Municipal Drain and Tile-Drainage



Legend

- Assessment Parcel
- Constructed Drains
  - Open or Unknown
  - Closed/Tiled
- Agricultural Tile Drainage
  - Random
  - Systematic

Map 2

SITE

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Ontario © King's Printer for Ontario and its licensors, 2025

May Not be Reproduced without Permission.
THIS IS NOT A PLAN OF SURVEY.

Map Created: 2/6/2025
Map Center: 43.6998 N, -80.43191 W

Easting (m)

530000 535000 540000 545000 550000 555000 560000 565000

Northing (m)

4860000 4855000 4850000 4845000 4840000 4835000 4830000

TOWN OF GRAND VALLEY

TOWNSHIP OF AMARANTH

TOWNSHIP OF WELLINGTON NORTH

TOWNSHIP OF EAST GARAFRAXA

TOWNSHIP OF CENTRE WELLINGTON

TOWNSHIP OF MAPLETON

TOWN OF ERIN

TOWNSHIP OF GUELPH/ERAMOSA

TOWNSHIP OF WOOLWICH

SITE

Arthur 7B

Arthur

Arthur 8A

Arthur 8B

Marsville 1

Orton

Alma

Salem

Elora

Fergus

Belwood Reservoir

Woolwich Reservoir

Elma Till

Tavistock Till

Port Stanley Till

Elmira Moraine

Waterloo Moraine / Easthope Moraine

Elmira

Guelph

Orangeville Moraine

A A' B B' C C' D D' E E'

F1 F2 F4 F5 F6 F7 E1 E3 E4

Four Mile Creek · Smoky Creek · Bosworth Creek · Fallons Creek · Mathews Creek · Branch Creek · Conestogo River · Canagagigue Creek · Irvine Creek · Bonne Creek · Willow Brook · Mud Lake · Grand River · Swan Creek · Carroll Creek · Grove River · Irvine Creek · Speed River · Marden Creek · Cox Creek · Eramosa River

Concession Road 2 & 3 · Wellington 16 Road · Sideroad 20 · 10 Sideroad · 9th Line · Wellington 24 Road · 16th Line · 2nd Line · 12th Line · Sideroad 5 · Sideroad 19 · 6th Line · Sideroad 15 · Sideroad 5 West · Sideroad 12 · Wellington 26 Road · Sideroad 4 · Sideroad 10 · Sideroad 8 North · Sideroad 6 South · 4th Line · Sideroad 17 · Townline Eramosa Garafraxa · Townline Erin Garafraxa

6 Line · 109 · 25 · 12 · 24 · 3 · 5 · 6 · 8 · 17 · 21 · 18 · 22 · 19 · 10 · 86 · 23 · 51 · 7 · 124

N

Study Area
Moraine
Municipal Boundary
Water Body
Watercourse
Highway
Road
Railroad Trail
Conceptual Cross Section Location
Municipal Well
High Quality Overburden Well

Surficial Geology

3: Paleozoic bedrock
5b: Stone-poor, carbonate-derived silty to sandy till
5d: Glaciolacustrine-derived silty to clayey till
6: Ice-contact stratified deposits
7: Glaciofluvial deposits
7a: Sandy deposits
7b: Gravelly deposits
8a: Massive-well laminated
9c: Foreshore-basinal deposits
19: Modern alluvial deposits
20: Organic deposits

Map 3

Reference: Data obtained from Grand River Conservation Authority (2017) and GeoBase® used under license. Municipal boundaries obtained from Ontario Ministry of Municipal Affairs and Housing.
Surficial Geology from the Ontario Geological Survey 2010. Surficial geology of Southern Ontario: Ontario Geological Survey, Miscellaneous Release--Data 128-REV.
Contains information licensed under the Open Government Licence – Ontario.

1:145,000 m
1,400 0 1,400 2,800
NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget and Local Area Risk Assessment

Surficial Geology

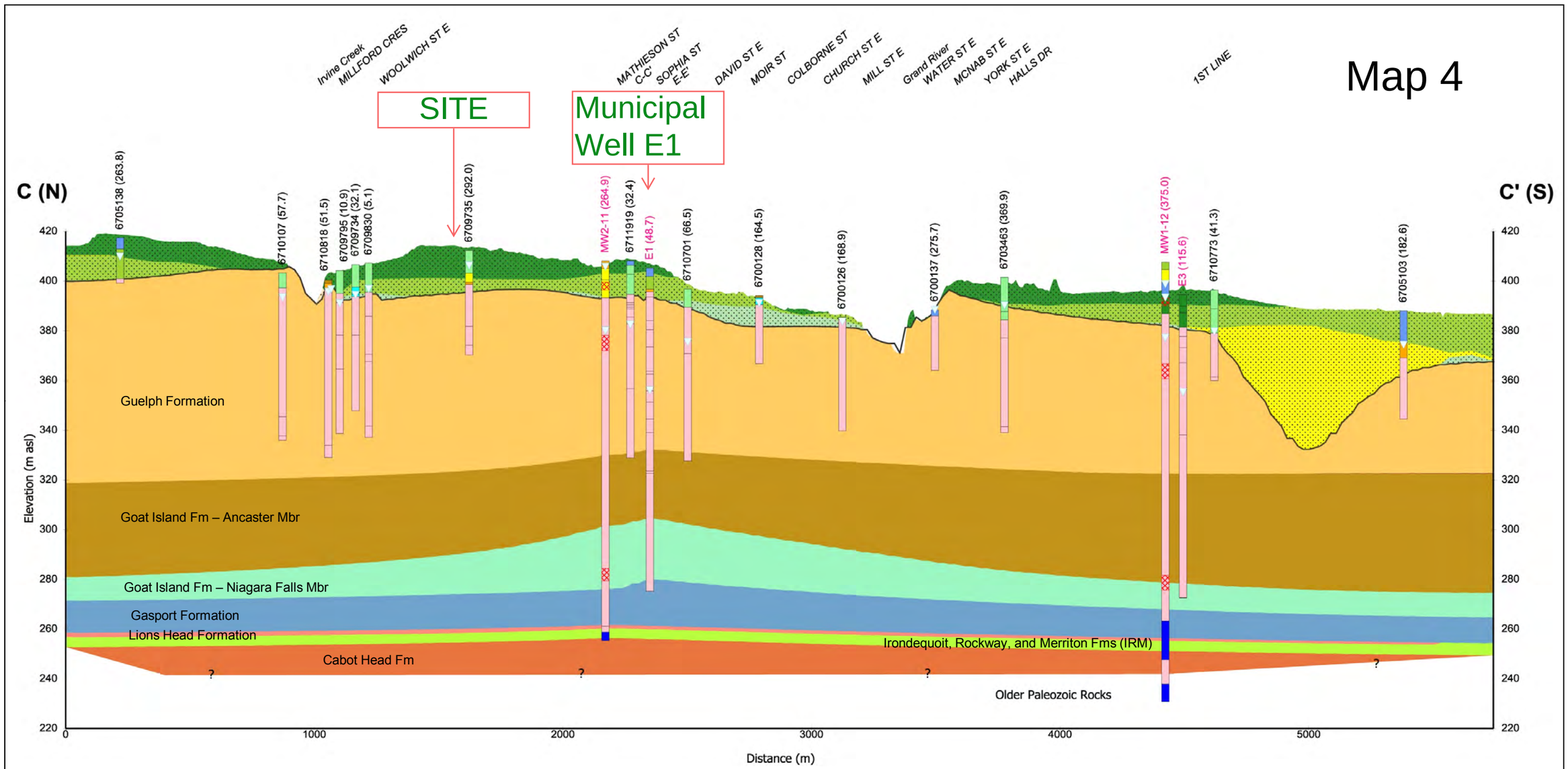
Date:	Project:	Technical:	Reviewer:	Drawn:
24 Nov 2017	23876	J. Melchin	P. Meyer	C. Curry

Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.

Figure 8

I:\Grand River\CA\23876\Figures and Tables\T3\2017\Report\Characterization Report\Figure-8-Surficial_Geology.mxd

Map 4



LEGEND

- Road
- Drainage
- Observed Water Level
- Profile
- Top of Bedrock
- Screened Interval

Borehole Lithology

- Topsoil, fill
- Organic deposits
- Clay, silty clay
- Silt, clayey silt, sandy silt
- Clay to clayey silt till
- Silt to sandy silt till
- Sandy till
- Sand, silty sand
- Gravelly sand, gravel
- Limestone, Dolostone
- Shale

Interpreted Unit

- Grand River Outwash (AFA2)
- Tavistock, Port Stanley Till (ATB1)
- Moraine Aquifer (AFB1)
- Maryhill/ Catfish Creek Drift (ATB3, ATC1, AFC1, ATC2)
- Pre-Catfish Aquifer (AFD1)
- Canning Drift Aquitard (ATE1)
- Pre-Canning Aquifer (AFF1)
- PreCanning Aquitard (ATG1)

NOTE: Water levels for domestic wells are levels contained within the WWIS. Water levels for high quality wells are from recent, higher quality transient water level observations.

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget and Local Area Risk Assessment

Local Elora Cross Section C-C'

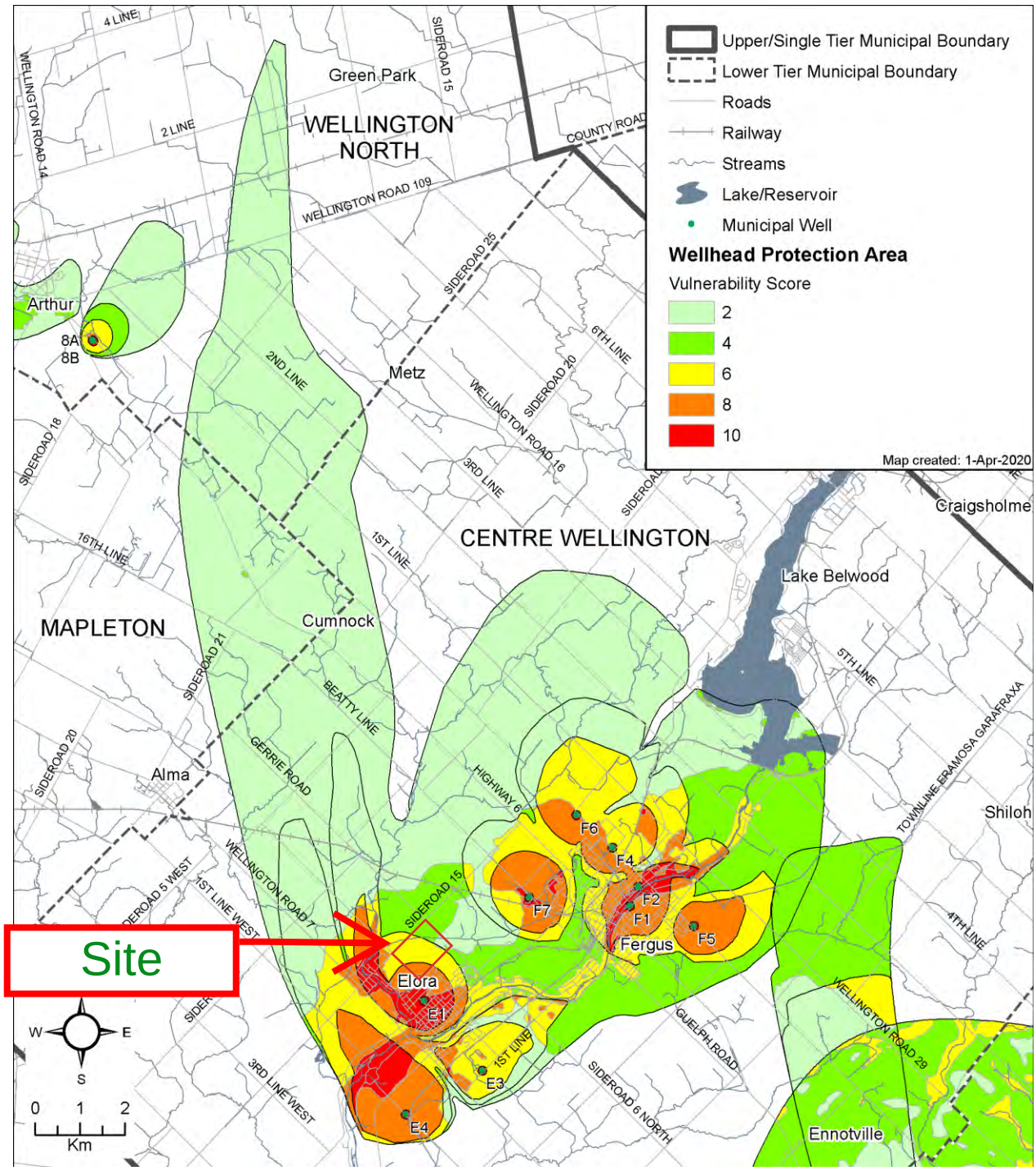
Date:	Project:	Technical:	Reviewer:	Drawn:
08 Nov 2017	23876	J. Melchin	P. Meyer	C.Curry

Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.

Figure 13

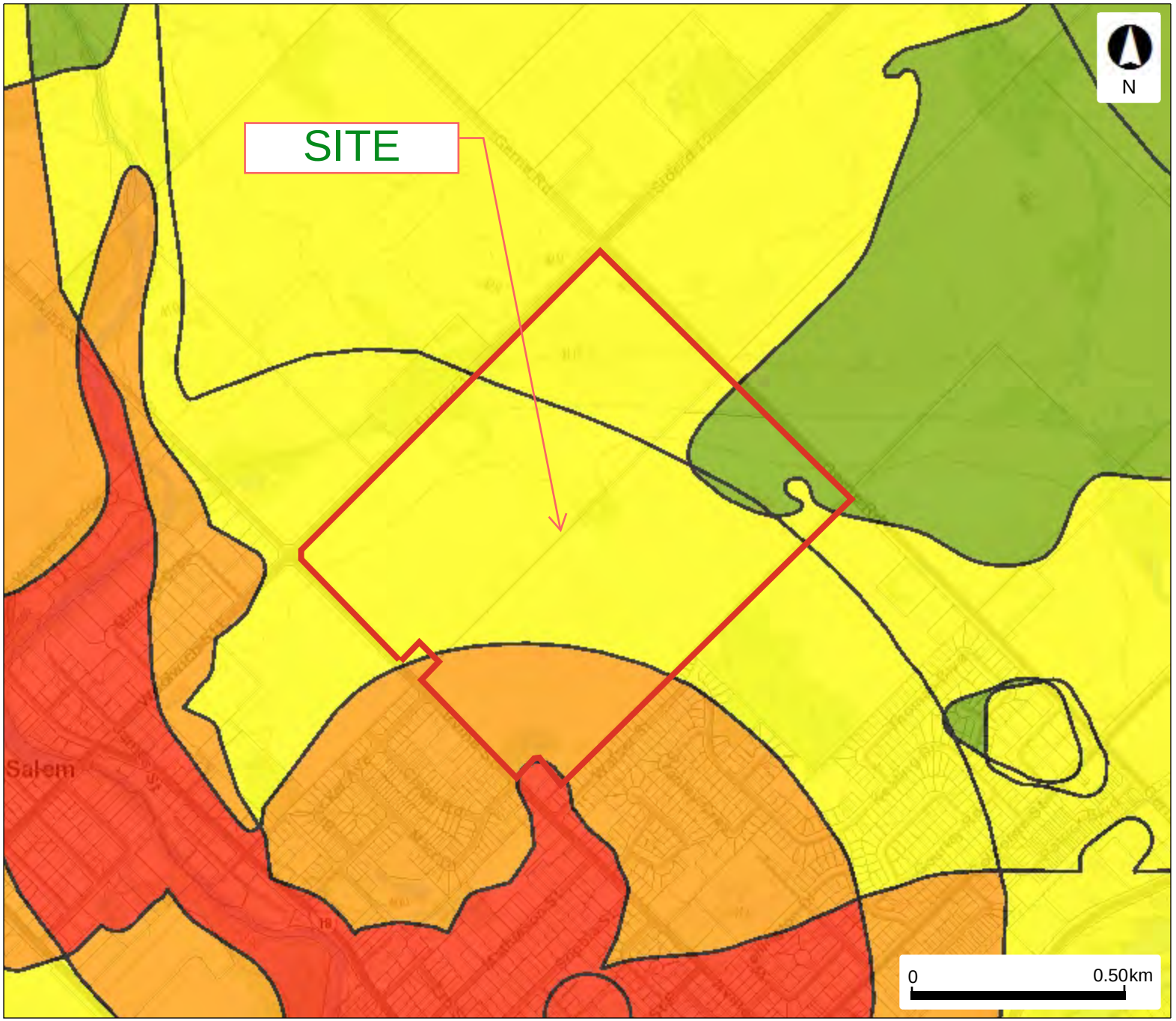
I:\GrandRiverCA\23876\Figures\andTables\T3\2017\Report\CharacterizationReport\Figure-13-Local_Elora_Cross_Section_C-C.mxd

Map 6-29: Centre Wellington Wellhead Protection Area Final Vulnerability



Map 5

MECP Bedrock Groundwater Vulnerability



Legend

Vulnerable Scoring Area - Groundwater

- 2
- 4
- 6
- 8
- 10

Assessment Parcel

Map 5b

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

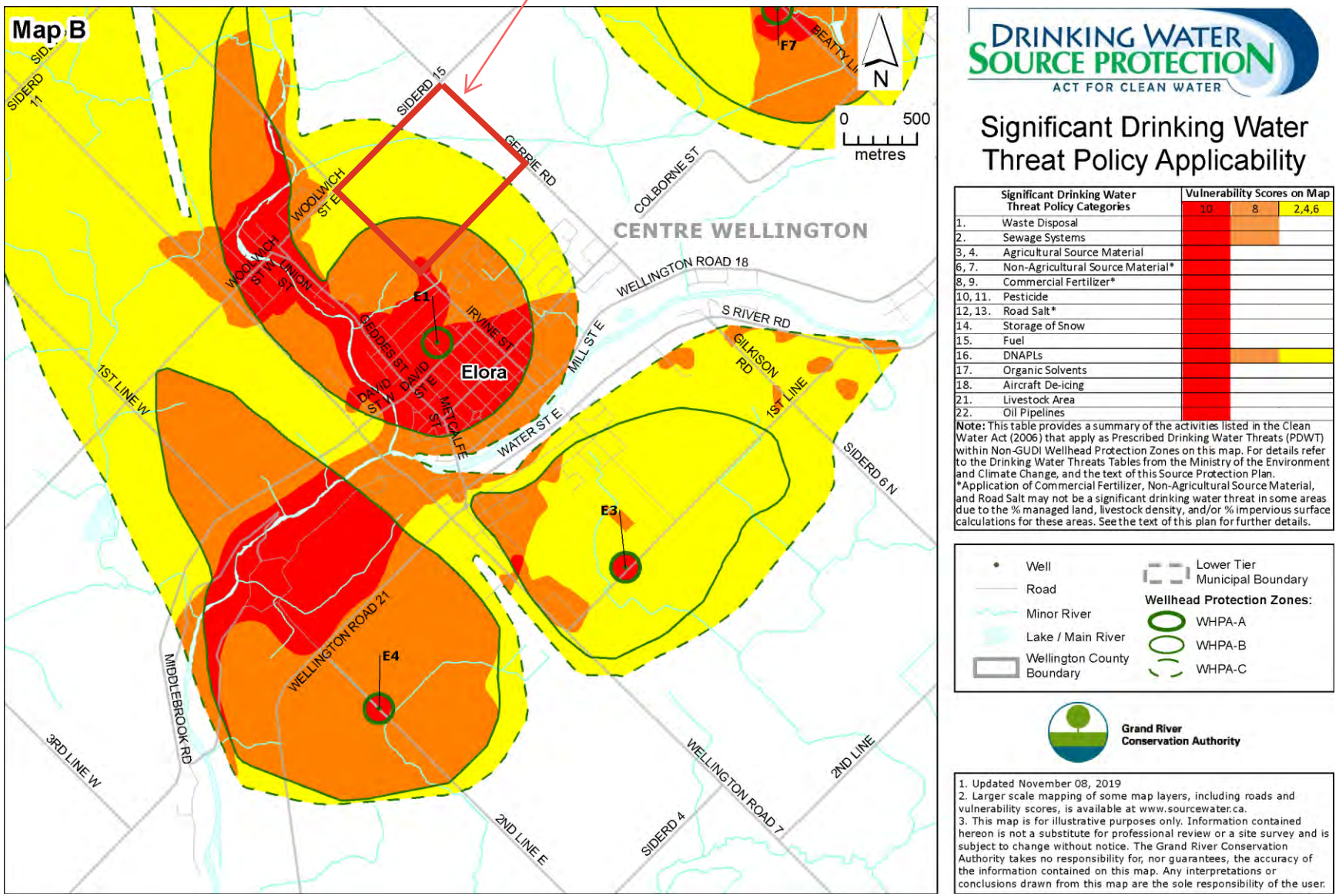
Ontario

© King's Printer for Ontario and its licensors, 2025

May Not be Reproduced without Permission.
THIS IS NOT A PLAN OF SURVEY.

Map Created: 2/27/2025
Map Center: 43.69877 N, -80.43112 W

7.12 Schedule F: County of Wellington, Centre Wellington Well, Map B



DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Significant Drinking Water Threat Policy Applicability

Significant Drinking Water Threat Policy Categories		Vulnerability Scores on Map		
		10	8	2,4,6
1.	Waste Disposal			
2.	Sewage Systems			
3, 4.	Agricultural Source Material			
6, 7.	Non-Agricultural Source Material*			
8, 9.	Commercial Fertilizer*			
10, 11.	Pesticide			
12, 13.	Road Salt*			
14.	Storage of Snow			
15.	Fuel			
16.	DNAPLs			
17.	Organic Solvents			
18.	Aircraft De-icing			
21.	Livestock Area			
22.	Oil Pipelines			

Note: This table provides a summary of the activities listed in the Clean Water Act (2006) that apply as Prescribed Drinking Water Threats (PDWT) within Non-GUDI Wellhead Protection Zones on this map. For details refer to the Drinking Water Threats Tables from the Ministry of the Environment and Climate Change, and the text of this Source Protection Plan.
*Application of Commercial Fertilizer, Non-Agricultural Source Material, and Road Salt may not be a significant drinking water threat in some areas due to the % managed land, livestock density, and/or % impervious surface calculations for these areas. See the text of this plan for further details.

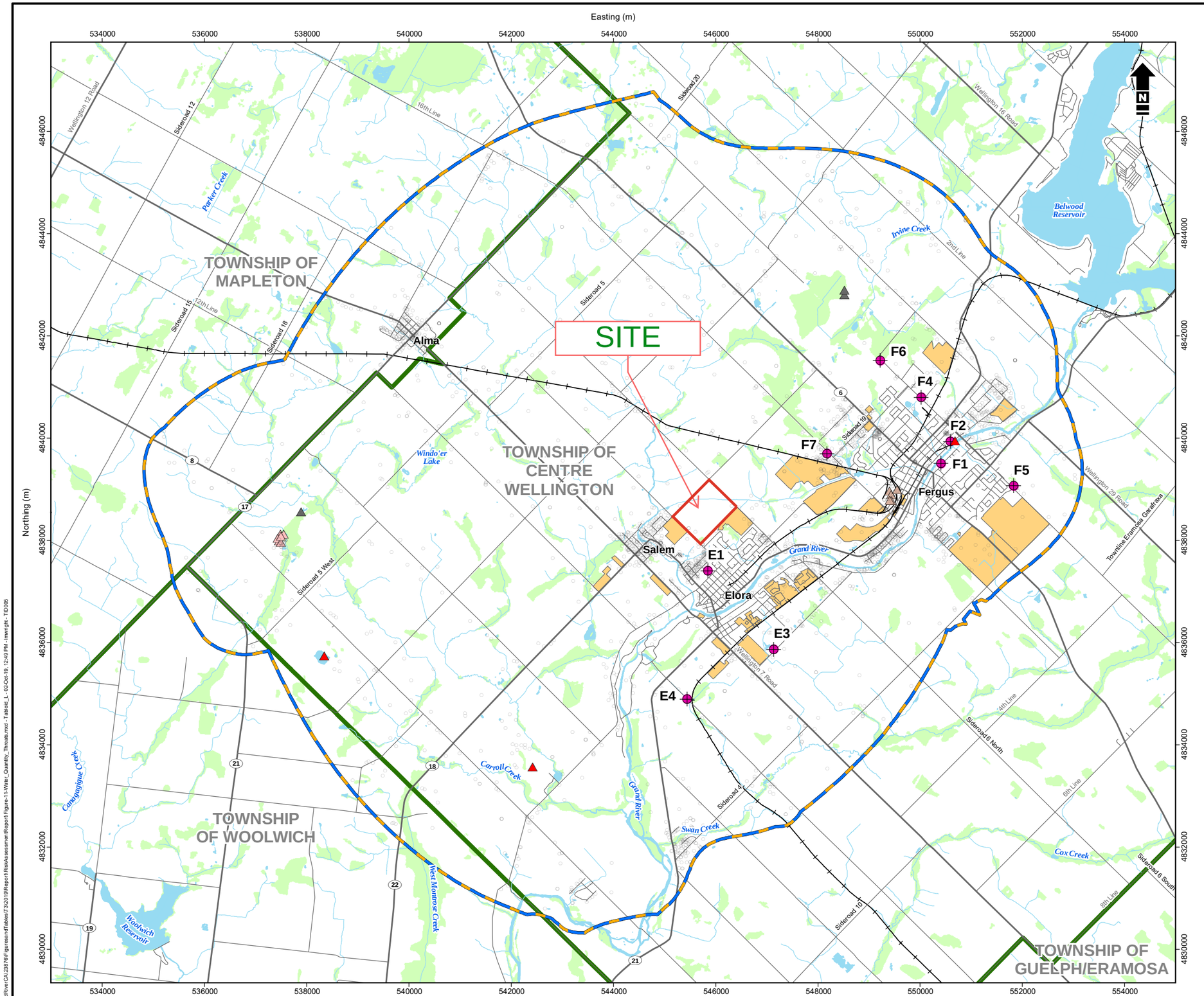
- Well
- Road
- Minor River
- Lake / Main River
- Wellington County Boundary
- Lower Tier Municipal Boundary

Wellhead Protection Zones:
- WHPA-A
- WHPA-B
- WHPA-C

Grand River Conservation Authority

1. Updated November 08, 2019
2. Larger scale mapping of some map layers, including roads and vulnerability scores, is available at www.sourcewater.ca.
3. This map is for illustrative purposes only. Information contained hereon is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

Map 6



- WHPA-Q1/WHPA-Q2/Groundwater Vulnerable Area
- Municipal Boundary
- Groundwater Recharge Reduction Threat
- Wetland
- Water Body
- Watercourse
- Highway
- Road
- Railroad Trail
- Municipal Well
- Non-Permitted Consumptive Water Taking Threat

Permitted Consumptive Water Taking Threat

- Commercial
- Industrial
- Miscellaneous
- Remediation

Map 7

Note: the Risk Level assignment to the Groundwater Vulnerable Area does not imply that an individual groundwater taking or recharge reduction activity within that area will threaten the reliability of the municipal water supply.

1:75,000 metres
750 0 750 1,500
NAD 1983 UTM Zone 17N

Reference: Data obtained from Grand River Conservation Authority (2017) and GeoBase® used under license. Contains information licensed under the Open Government Licence – Ontario.

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget Assessment - Risk Assessment Report

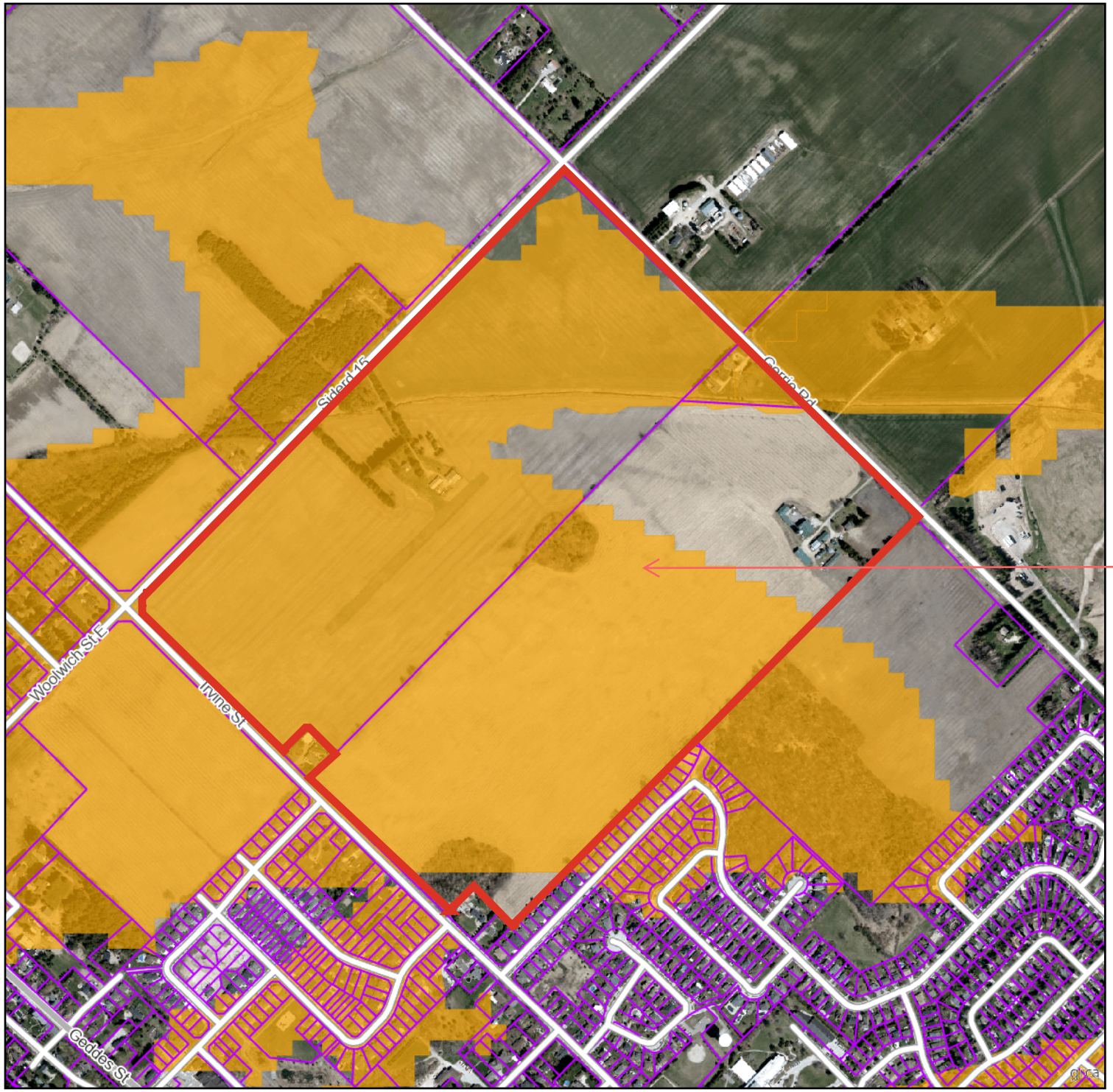
Water Quantity Threats

Date:	Project:	Submitter:	Reviewer:
October 2019	23876	J. Melchin	D. Van Vliet

Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.

Figure 11

I:\GrandRiverCA\23876\Figures\and\Tables\T3\2019\Report\RiskAssessment\Report\Figure-11-Water_Quantity_Threats.mxd - Tabloid_L - 02-Oct-19, 12:49 PM -mwright - TID05



Grand River Conservation Authority

Date: Mar 06, 2025

Significant Groundwater Recharge Area

Legend

- Parcel - Assessment (MPAC/MNRF)
- Signif. GW Recharge - Tier 2 (GRCA)

Map 8

SITE

Copyright Grand River Conservation Authority, 2025.

Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend.
See Sources and Citations for details.

Scale 1:9,106

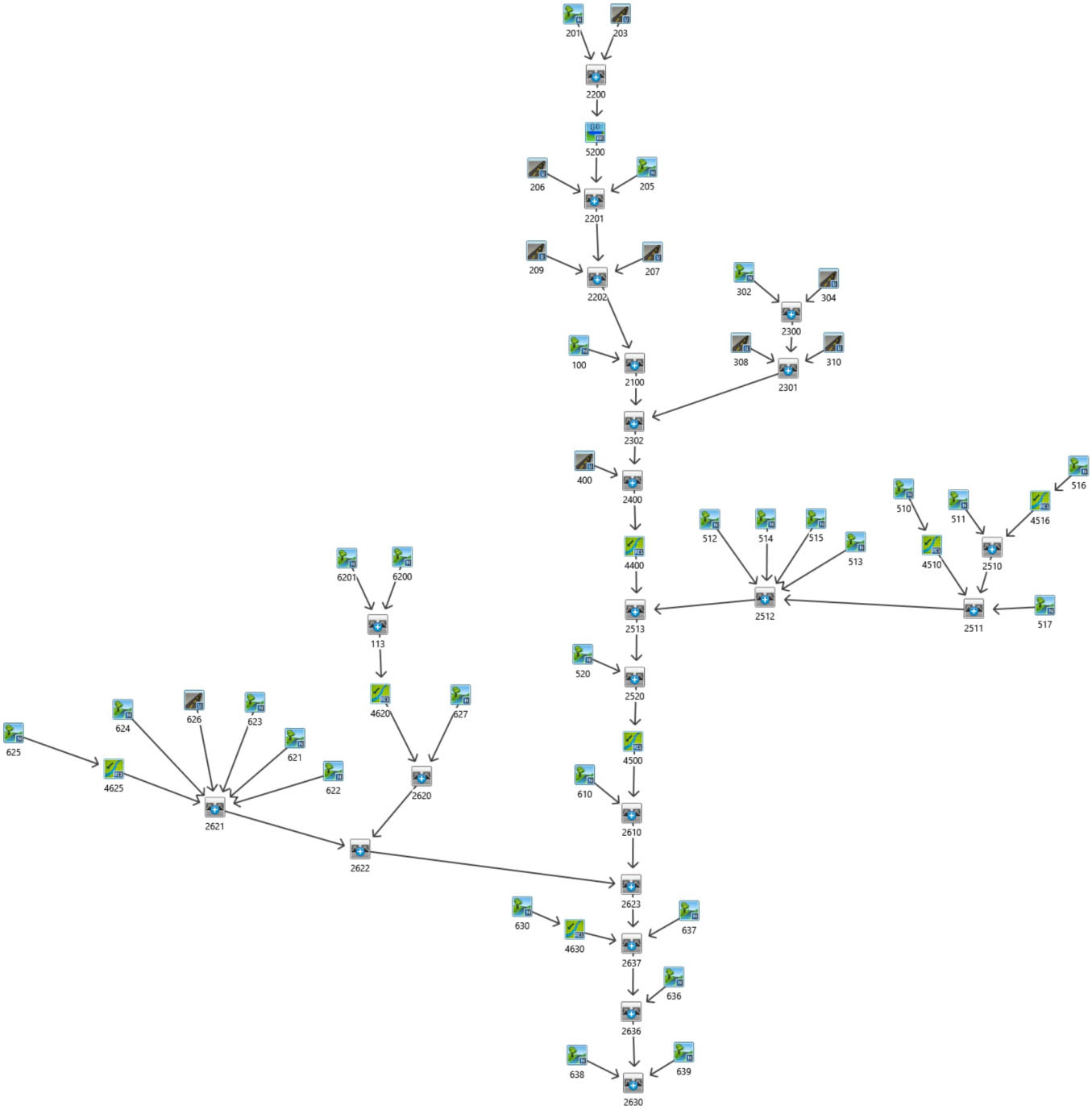
NAD83 UTM zone 17 (EPSG:26917)

Map Centre (X,Y): 545855.94, 4838565.21 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)

Appendix F

Stormwater Management


201
203
2200
5200
206
205
2201
209
207
2202
302
304
2300
100
308
310
2301
2100
2302
400
2400
4400
516
510
511
4516
512
514
515
513
4510
2510
6201
6200
2513
2512
2511
517
113
520
2520
4620
627
624
626
623
625
621
4500
4625
622
2620
610
2621
2610
2622
2623
630
637
4630
2637
636
2636
638
639
2630

```
  ***********************************************
  ** SIMULATION : 2 year Fergus Shand Dam Chica **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 721.000
| Ptotal= 36.04 mm |                          B=   6.000
--------------------                          C=   0.796
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.15 |  1.00   10.02 |  2.00    6.24 |  3.00    2.89
                0.08    2.28 |  1.08   15.64 |  2.08    5.65 |  3.08    2.77
                0.17    2.44 |  1.17   36.22 |  2.17    5.18 |  3.17    2.67
                0.25    2.62 |  1.25  106.90 |  2.25    4.78 |  3.25    2.57
                0.33    2.83 |  1.33   46.53 |  2.33    4.44 |  3.33    2.48
                0.42    3.08 |  1.42   25.96 |  2.42    4.15 |  3.42    2.40
                0.50    3.39 |  1.50   17.80 |  2.50    3.90 |  3.50    2.32
                0.58    3.79 |  1.58   13.52 |  2.58    3.68 |  3.58    2.25
                0.67    4.29 |  1.67   10.91 |  2.67    3.49 |  3.67    2.18
                0.75    4.97 |  1.75    9.16 |  2.75    3.31 |  3.75    2.12
                0.83    5.94 |  1.83    7.91 |  2.83    3.16 |  3.83    2.06
                0.92    7.43 |  1.92    6.97 |  2.92    3.02 |  3.92    2.01


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   0.840 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=   6.637
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.184

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.153 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=   9.637
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.267

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69          4.51
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=       1.20          1.20
     Length            (m)=      25.00         25.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     106.90         21.28
               over (min)        5.00         15.00
     Storage Coeff.  (min)=       1.03 (ii)    12.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00         15.00
     Unit Hyd. peak  (cms)=       0.34          0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.61          0.17          0.650 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04          9.66          15.76
     TOTAL RAINFALL   (mm)=      36.04         36.04          36.04
     RUNOFF COEFFICIENT   =       0.94          0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.153     2.58     9.64
     + ID2= 2 (  0203):     8.20   0.650     1.33    15.76
       ==========================================================
       ID = 3 (  2200):    22.80   0.655     1.33    11.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1980      0.2314
                          0.0040      0.0218   |    0.2920      0.2621
                          0.0060      0.0446   |    0.3980      0.2937
                          0.0070      0.0683   |    0.5150      0.3261
                          0.0080      0.0930   |    0.8290      0.3592
                          0.0090      0.1187   |    1.3520      0.3930
                          0.0230      0.1453   |    2.0570      0.4275
                          0.0610      0.1730   |    2.9590      0.4629
                          0.1200      0.2017   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
```

```
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      0.655      1.33      11.84
   OUTFLOW: ID= 1 (  5200)     22.800      0.102      4.08      11.78

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.58
                  TIME SHIFT OF PEAK FLOW         (min)=165.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1930
```

```
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.190 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.006
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.527

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        21.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.03 (ii)   12.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.016 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.73
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.190     1.83    19.01
     + ID2= 2 (  0206):     0.20   0.016     1.33    15.73
       ================================================
       ID = 3 (  2201):     5.00   0.195     1.83    18.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.195     1.83    18.87
     + ID2= 2 (  5200):    22.80   0.102     4.08    11.78
       ================================================
       ID = 1 (  2201):    27.80   0.202     1.83    13.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        11.67
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       1.25 (ii)   19.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.33         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.04          0.070 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      34.04         7.85           9.94
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.22           0.28

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
```

```
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        21.28
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.03 (ii)   12.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.03          0.103 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.75
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0207):     1.30   0.103     1.33    15.75
      + ID2= 2 (  0209):     2.70   0.070     1.33     9.94
        ================================================
        ID = 3 (  2202):     4.00   0.173     1.33    11.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2202):     4.00   0.173     1.33    11.83
      + ID2= 2 (  2201):    27.80   0.202     1.83    13.05
        ================================================
        ID = 1 (  2202):    31.80   0.281     1.75    12.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0100):   136.98   0.840     3.00     6.64
      + ID2= 2 (  2202):    31.80   0.281     1.75    12.90
        ================================================
        ID = 3 (  2100):   168.78   0.969     2.92     7.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.051 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   9.636
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.267

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        21.28
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.08 (ii)   13.25 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.09          0.347 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.76
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0302):     2.90   0.051     1.92     9.64
      + ID2= 2 (  0304):     4.40   0.347     1.33    15.76
        ================================================
        ID = 3 (  2300):     7.30   0.354     1.33    13.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
```

```
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.09         0.11
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    106.90        21.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      1.08 (ii)   13.25 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.01         0.00          0.016 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=     34.04         9.66          15.72
     TOTAL RAINFALL   (mm)=     36.04        36.04          36.04
     RUNOFF COEFFICIENT   =      0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.91         4.79
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    106.90        13.48
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      1.03 (ii)   14.86 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.13         0.11          0.159 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=     34.04         7.85           9.94
     TOTAL RAINFALL   (mm)=     36.04        36.04          36.04
     RUNOFF COEFFICIENT   =      0.94         0.22           0.28

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.354     1.33    13.32
     + ID2= 2 (  0308):     0.20   0.016     1.33    15.72
       ================================================
       ID = 3 (  2301):     7.50   0.370     1.33    13.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.370     1.33    13.39
     + ID2= 2 (  0310):     5.70   0.159     1.33     9.94
       ================================================
       ID = 1 (  2301):    13.20   0.529     1.33    11.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   0.969     2.92     7.82
     + ID2= 2 (  2301):    13.20   0.529     1.33    11.90
       ================================================
       ID = 3 (  2302):   181.98   1.046     2.83     8.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      8.29        74.57
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      0.70         2.00
     Length            (m)=   1437.00        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     53.90        10.84
               over (min)       20.00        40.00
     Storage Coeff.  (min)=     18.02 (ii)   35.18 (ii)
     Unit Hyd. Tpeak (min)=     20.00        40.00
     Unit Hyd. peak  (cms)=      0.06         0.03
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.25         0.90          1.023 (iii)
     TIME TO PEAK    (hrs)=      1.58         2.08           2.00
     RUNOFF VOLUME    (mm)=     34.04         7.45           8.24
     TOTAL RAINFALL   (mm)=     36.04        36.04          36.04
     RUNOFF COEFFICIENT   =      0.94         0.21           0.23

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
```

```
             YOU SHOULD CONSIDER SPLITTING THE AREA.

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2302):   181.98   1.046     2.83     8.11
      + ID2= 2 (  0400):    82.86   1.023     2.00     8.24
        ================================================
        ID = 3 (  2400):   264.84   1.942     2.08     8.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         411.10        0.0550
                  27.30         410.20        0.0550
                  77.50         409.10        0.0550
                  96.60         409.10        0.0550
                 115.80         408.90        0.0550
                 124.80         409.10        0.0550
                 131.00         408.90    0.0550 /0.0350  Main Channel
                 133.60         408.00        0.0350      Main Channel
                 134.40         407.60        0.0350      Main Channel
                 135.00         407.50        0.0350      Main Channel
                 135.80         407.60        0.0350      Main Channel
                 136.50         408.00        0.0350      Main Channel
                 139.40         408.80    0.0350 /0.0550  Main Channel
                 143.50         408.90        0.0550
                 148.50         408.70        0.0550
                 163.80         408.90        0.0550
                 183.20         408.90        0.0550
                 243.70         409.70        0.0550
                 278.70         410.20        0.0550
                 330.50         411.40        0.0550

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.19   407.69    .366E+03       0.1          0.51      58.83
        0.37   407.87    .106E+04       0.5          0.81      37.08
        0.56   408.06    .199E+04       1.1          1.00      29.93
        0.74   408.24    .328E+04       2.1          1.14      26.32
        0.93   408.43    .498E+04       3.6          1.28      23.32
        1.11   408.61    .708E+04       5.6          1.43      20.94
        1.30   408.80    .105E+05       8.5          1.45      20.61
        1.49   408.99    .247E+05      14.8          1.07      27.91
        1.68   409.18    .601E+05      30.4          0.91      32.97
        1.87   409.37    .109E+06      58.5          0.96      31.05
        2.06   409.56    .166E+06      98.3          1.06      28.11
        2.25   409.75    .231E+06     150.3          1.17      25.57
        2.44   409.94    .303E+06     215.4          1.28      23.46
        2.64   410.14    .383E+06     293.8          1.38      21.74
        2.83   410.33    .470E+06     390.1          1.49      20.10
        3.02   410.52    .563E+06     502.4          1.60      18.66
        3.21   410.71    .660E+06     628.8          1.71      17.48
        3.40   410.90    .762E+06     769.5          1.81      16.49
        3.59   411.09    .868E+06     924.9          1.91      15.65

                                  <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84    1.94    2.08   8.15      0.72      1.12
   OUTFLOW: ID= 1 (  4400)  264.84    1.71    2.67   8.15      0.67      1.08


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  90.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.70

     Unit Hyd Qpeak  (cms)=   2.039

     PEAK FLOW       (cms)=   0.466 (i)
     TIME TO PEAK    (hrs)=   3.667
     RUNOFF VOLUME    (mm)=   7.148
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.198

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70    0.0350 /0.0350  Main Channel
                   8.20         414.20        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350        in Channel
```

-0.00	0.00	0.0350	hannel
-0.00	0.00	0.0350	el
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
0.00	0.00	0.0350	
1.00	1.00	0.0350	
4510.00	2.00	0.0000	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN

**** WARNING: INFLOW HYDROGRAPH IS DRY!!

CALIB					
NASHYD (0511)	Area	(ha)=	54.65	Curve Number	(CN)= 71.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.52		

Unit Hyd Qpeak (cms)= 4.014

PEAK FLOW (cms)= 0.618 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 7.148
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.198

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0516)	Area	(ha)=	11.47	Curve Number	(CN)= 71.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.56		

Unit Hyd Qpeak (cms)= 0.782

PEAK FLOW (cms)= 0.124 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 7.148
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.198

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4516)		
IN= 2---> OUT= 1	Routing time step (min)=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.125E+02	0.0	0.27	43.74
0.16	412.86	.500E+02	0.0	0.42	27.55
0.24	412.94	.113E+03	0.1	0.55	21.03
0.32	413.02	.200E+03	0.2	0.67	17.36
0.39	413.09	.313E+03	0.3	0.78	14.96
0.47	413.17	.450E+03	0.6	0.88	13.25
0.55	413.25	.613E+03	0.9	0.98	11.95
0.63	413.33	.801E+03	1.2	1.07	10.93
0.71	413.41	.101E+04	1.7	1.15	10.11
0.79	413.49	.125E+04	2.2	1.24	9.42
0.87	413.57	.151E+04	2.9	1.32	8.84
0.95	413.65	.180E+04	3.6	1.40	8.34
1.03	413.73	.211E+04	4.5	1.47	7.91
1.11	413.81	.245E+04	5.4	1.55	7.53
1.18	413.88	.281E+04	6.5	1.62	7.19
1.26	413.96	.320E+04	7.7	1.69	6.89
1.34	414.04	.362E+04	9.1	1.76	6.62
1.42	414.12	.405E+04	10.6	1.83	6.37
1.50	414.20	.452E+04	12.3	1.90	6.14

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0516)	11.47	0.12	2.08	7.15	0.26	0.59
OUTFLOW: ID= 1 (4516)	11.47	0.11	2.42	7.13	0.25	0.57

```
--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4516):    11.47   0.109     2.42     7.13
     + ID2= 2 (  0511):    54.65   0.618     2.00     7.15
       ================================================
       ID = 3 (  2510):    66.12   0.711     2.08     7.14

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   1.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

    Unit Hyd Qpeak  (cms)=   0.209

    PEAK FLOW       (cms)=   0.027 (i)
    TIME TO PEAK    (hrs)=   1.750
    RUNOFF VOLUME    (mm)=   7.145
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.198

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):    66.12   0.711     2.08     7.14
     + ID2= 2 (  4510):    90.75   0.466     3.67     7.15
       ================================================
       ID = 3 (  2511):   156.87   0.928     2.33     7.15

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2511):   156.87   0.928     2.33     7.15
     + ID2= 2 (  0517):     1.75   0.027     1.75     7.15
       ================================================
       ID = 1 (  2511):   158.62   0.943     2.25     7.15

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0512)|   Area    (ha)=  31.10   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.71

    Unit Hyd Qpeak  (cms)=   1.673

    PEAK FLOW       (cms)=   0.288 (i)
    TIME TO PEAK    (hrs)=   2.333
    RUNOFF VOLUME    (mm)=   7.148
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.198

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0514)|   Area    (ha)=   2.65   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.60

    Unit Hyd Qpeak  (cms)=   0.169

    PEAK FLOW       (cms)=   0.022 (i)
    TIME TO PEAK    (hrs)=   2.167
    RUNOFF VOLUME    (mm)=   5.741
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.159

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.41   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

    Unit Hyd Qpeak  (cms)=   0.504

    PEAK FLOW       (cms)=   0.056 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=   5.740
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.159

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0513)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

    Unit Hyd Qpeak  (cms)=   1.276

    PEAK FLOW       (cms)=   0.134 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=   7.134
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.198

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
       ID1= 1 (  2511):   158.62   0.943     2.25     7.15
     + ID2= 2 (  0512):    31.10   0.288     2.33     7.15
       ================================================
       ID = 3 (  2512):   189.72   1.231     2.33     7.15

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   189.72   1.231     2.33     7.15
     + ID2= 2 (  0513):     6.68   0.134     1.58     7.13
       ================================================
       ID = 1 (  2512):   196.40   1.276     2.25     7.15

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   196.40   1.276     2.25     7.15
     + ID2= 2 (  0514):     2.65   0.022     2.17     5.74
       ================================================
       ID = 3 (  2512):   199.05   1.297     2.25     7.13

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   199.05   1.297     2.25     7.13
     + ID2= 2 (  0515):     5.41   0.056     1.92     5.74
       ================================================
       ID = 1 (  2512):   204.46   1.343     2.25     7.09

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   204.46   1.343     2.25     7.09
     + ID2= 2 (  4400):   264.84   1.711     2.67     8.15
       ================================================
       ID = 3 (  2513):   469.30   2.986     2.50     7.69

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

    Unit Hyd Qpeak  (cms)=   3.449

    PEAK FLOW       (cms)=   0.706 (i)
    TIME TO PEAK    (hrs)=   3.000
    RUNOFF VOLUME    (mm)=   7.148
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.198

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   469.30   2.986     2.50     7.69
     + ID2= 2 (  0520):   108.36   0.706     3.00     7.15
       ================================================
       ID = 3 (  2520):   577.66   3.630     2.58     7.59

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------

              <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                0.00         409.70        0.0550
               19.70         408.80        0.0550
               41.70         407.20        0.0550
               60.50         405.30        0.0550
               80.00         404.50        0.0550
               95.70         404.60    0.0550 /0.0350  Main Channel
               98.60         403.40        0.0350      Main Channel
              100.40         403.40        0.0350      Main Channel
              100.80         402.90        0.0350      Main Channel
              101.50         402.70        0.0350      Main Channel
              102.30         402.80        0.0350      Main Channel
              103.30         403.20        0.0350      Main Channel
              104.00         403.20        0.0350      Main Channel
              105.60         404.40    0.0350 /0.0550  Main Channel
              109.70         404.30        0.0550
              128.60         404.20        0.0550
              154.10         405.40        0.0550
              179.10         406.70        0.0550
              201.90         408.60        0.0550
              224.20         410.60        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.34    403.04    .954E+03       0.3         0.70       47.40
      0.68    403.38    .304E+04       1.6         1.03       32.27
      1.02    403.72    .718E+04       4.5         1.25       26.57
      1.36    404.06    .122E+05       9.7         1.58       20.96
      1.70    404.40    .251E+05      18.1         1.44       23.04
      2.08    404.78    .650E+05      42.3         1.29       25.62
      2.46    405.16    .122E+06      86.3         1.40       23.62
      2.84    405.54    .192E+06     151.6         1.57       21.10
      3.21    405.91    .270E+06     238.3         1.75       18.90
      3.59    406.29    .357E+06     345.8         1.93       17.20
      3.97    406.67    .452E+06     474.9         2.09       15.85
      4.35    407.05    .554E+06     631.1         2.26       14.63
```

4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2520)	577.66	3.63	2.58	7.59	0.92	1.17
OUTFLOW: ID= 1 (4500)	577.66	3.34	3.17	7.59	0.88	1.15

CALIB					
NASHYD (0610)	Area (ha)=	78.05	Curve Number (CN)=	71.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	1.00			

Unit Hyd Qpeak (cms)= 2.981

PEAK FLOW (cms)= 0.575 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 7.148
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.198

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2610)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
1 + 2 = 3	ID1= 1 (4500):	577.66	3.341	3.17	7.59
	+ ID2= 2 (0610):	78.05	0.575	2.75	7.15
	ID = 3 (2610):	655.71	3.882	3.08	7.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0623)	Area (ha)=	19.37	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.45			

Unit Hyd Qpeak (cms)= 1.644

PEAK FLOW (cms)= 0.231 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 6.886
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0625)	Area (ha)=	6.72	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.39			

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.088 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 6.886
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN (4625)		
IN= 2---> OUT= 1	Routing time step (min)=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0360	Main Channel
4.30	412.70	0.0360	Main Channel
8.60	414.20	0.0360	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.108E+02	0.0	0.24	42.13
0.16	412.86	.434E+02	0.0	0.38	26.54
0.24	412.94	.976E+02	0.1	0.50	20.26
0.32	413.02	.174E+03	0.2	0.61	16.72
0.39	413.09	.271E+03	0.3	0.70	14.41
0.47	413.17	.390E+03	0.5	0.79	12.76
0.55	413.25	.532E+03	0.8	0.88	11.51
0.63	413.33	.694E+03	1.1	0.96	10.53
0.71	413.41	.879E+03	1.5	1.04	9.74
0.79	413.49	.108E+04	2.0	1.11	9.08
0.87	413.57	.131E+04	2.6	1.19	8.52
0.95	413.65	.156E+04	3.2	1.26	8.04
1.03	413.73	.183E+04	4.0	1.33	7.62
1.11	413.81	.213E+04	4.9	1.39	7.25
1.18	413.88	.244E+04	5.9	1.46	6.93
1.26	413.96	.278E+04	7.0	1.52	6.64
1.34	414.04	.313E+04	8.2	1.59	6.37
1.42	414.12	.351E+04	9.5	1.65	6.13
1.50	414.20	.392E+04	11.0	1.71	5.92

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0625)	6.72	0.09	1.83	6.89	0.24	0.51
OUTFLOW: ID= 1 (4625)	6.72	0.07	2.17	6.85	0.22	0.47

CALIB					
NASHYD (0622)	Area (ha)=	9.69	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	

```
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.133 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.885
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.64         0.42
     Dep. Storage     (mm)=      1.00        10.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     84.06        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    106.90        10.78
               over (min)        5.00        20.00
     Storage Coeff.  (min)=      2.24 (ii)   19.44 (ii)
     Unit Hyd. Tpeak (min)=      5.00        20.00
     Unit Hyd. peak  (cms)=      0.30         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.15         0.01          0.147 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.75           1.33
     RUNOFF VOLUME    (mm)=     35.04         6.83          20.92
     TOTAL RAINFALL   (mm)=     36.04        36.04          36.04
     RUNOFF COEFFICIENT   =      0.97         0.19           0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.089 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.885
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.131 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.071     2.17     6.85
     + ID2= 2 (  0621):     6.56   0.089     1.83     6.89
       ================================================
       ID = 3 (  2621):    13.28   0.149     2.00     6.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    13.28   0.149     2.00     6.87
     + ID2= 2 (  0622):     9.69   0.133     1.83     6.89
       ================================================
       ID = 1 (  2621):    22.97   0.276     1.92     6.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    22.97   0.276     1.92     6.88
     + ID2= 2 (  0623):    19.37   0.231     1.92     6.89
       ================================================
       ID = 3 (  2621):    42.34   0.507     1.92     6.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    42.34   0.507     1.92     6.88
     + ID2= 2 (  0624):    11.84   0.131     2.00     6.89
       ================================================
       ID = 1 (  2621):    54.18   0.635     1.92     6.88
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2621):		54.18	0.635	1.92	6.88
+ ID2= 2 (0626):		1.06	0.147	1.33	20.92
ID = 3 (2621):		55.24	0.654	1.92	7.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0627)	Area	(ha)=	6.68	Curve Number	(CN)= 70.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.20		

Unit Hyd Qpeak (cms)= 1.276

PEAK FLOW (cms)= 0.129 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 6.874
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (6200)	Area	(ha)=	6.66	Curve Number	(CN)= 74.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.28		

Unit Hyd Qpeak (cms)= 0.908

PEAK FLOW (cms)= 0.125 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 8.006
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.222

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (6201)	Area	(ha)=	0.82	Curve Number	(CN)= 74.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.15		

Unit Hyd Qpeak (cms)= 0.209

PEAK FLOW (cms)= 0.022 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 7.963
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.221

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0113)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (6200):		6.66	0.125	1.67	8.01
+ ID2= 2 (6201):		0.82	0.022	1.50	7.96
ID = 3 (0113):		7.48	0.141	1.67	8.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4620)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.456E+01	0.0	0.55	7.70
0.16	412.86	.182E+02	0.1	0.88	4.85
0.24	412.94	.410E+02	0.2	1.15	3.70
0.32	413.02	.729E+02	0.4	1.39	3.05
0.39	413.09	.114E+03	0.7	1.61	2.63
0.47	413.17	.164E+03	1.2	1.82	2.33
0.55	413.25	.223E+03	1.8	2.02	2.10
0.63	413.33	.292E+03	2.5	2.21	1.92
0.71	413.41	.369E+03	3.5	2.39	1.78
0.79	413.49	.456E+03	4.6	2.56	1.66
0.87	413.57	.551E+03	5.9	2.73	1.56
0.95	413.65	.656E+03	7.4	2.89	1.47
1.03	413.73	.770E+03	9.2	3.05	1.39
1.11	413.81	.893E+03	11.2	3.21	1.32
1.18	413.88	.103E+04	13.5	3.36	1.27
1.26	413.96	.117E+04	16.0	3.51	1.21
1.34	414.04	.132E+04	18.9	3.65	1.16
1.42	414.12	.148E+04	22.0	3.79	1.12
1.50	414.20	.165E+04	25.4	3.93	1.08

		<---- hydrograph ---->				<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0113)		7.48	0.14	1.67	8.00	0.21	1.03
OUTFLOW: ID= 1 (4620)		7.48	0.14	1.75	8.00	0.21	1.03

ADD HYD (2620)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (4620):		7.48	0.139	1.75	8.00
+ ID2= 2 (0627):		6.68	0.129	1.58	6.87

```
        ================================================
        ID = 3 (  2620):    14.16   0.259     1.67     7.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2620):    14.16   0.259     1.67     7.47
      + ID2= 2 (  2621):    55.24   0.654     1.92     7.15
        ================================================
        ID = 3 (  2622):    69.40   0.864     1.83     7.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2623)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2610):   655.71   3.882     3.08     7.54
      + ID2= 2 (  2622):    69.40   0.864     1.83     7.22
        ================================================
        ID = 3 (  2623):   725.11   4.217     3.00     7.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679

     PEAK FLOW       (cms)=   0.097 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   0.439 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY    TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)       (min)
      0.08   412.78    .893E+01       0.0          0.17       47.72
      0.16   412.86    .357E+02       0.0          0.28       30.06
      0.24   412.94    .804E+02       0.1          0.36       22.94
      0.32   413.02    .143E+03       0.1          0.44       18.94
      0.39   413.09    .223E+03       0.2          0.51       16.32
      0.47   413.17    .322E+03       0.4          0.58       14.45
      0.55   413.25    .438E+03       0.6          0.64       13.04
      0.63   413.33    .572E+03       0.8          0.70       11.93
      0.71   413.41    .724E+03       1.1          0.76       11.03
      0.79   413.49    .893E+03       1.4          0.81       10.28
      0.87   413.57    .108E+04       1.9          0.86        9.65
      0.95   413.65    .129E+04       2.4          0.92        9.10
      1.03   413.73    .151E+04       2.9          0.97        8.63
      1.11   413.81    .175E+04       3.6          1.01        8.22
      1.18   413.88    .201E+04       4.3          1.06        7.85
      1.26   413.96    .229E+04       5.1          1.11        7.52
      1.34   414.04    .258E+04       6.0          1.15        7.22
      1.42   414.12    .289E+04       6.9          1.20        6.95
      1.50   414.20    .323E+04       8.0          1.24        6.70

                                  <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     0.44    1.83   6.89      0.50      0.60
   OUTFLOW: ID= 1 (  4630)   33.04     0.38    2.08   6.88      0.48      0.58


--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2623):   725.11   4.217     3.00     7.51
      + ID2= 2 (  4630):    33.04   0.384     2.08     6.88
        ================================================
        ID = 3 (  2637):   758.15   4.414     2.92     7.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2637):   758.15   4.414     2.92     7.48
      + ID2= 2 (  0637):     8.36   0.097     2.00     6.89
        ================================================
        ID = 1 (  2637):   766.51   4.461     2.83     7.47
```

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.038 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2637):   766.51   4.461     2.83     7.47
      + ID2= 2 (  0636):     3.32   0.038     2.00     6.89
        ================================================
        ID = 3 (  2636):   769.83   4.482     2.83     7.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.057 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   0.243 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2636):   769.83   4.482     2.83     7.47
      + ID2= 2 (  0638):    20.63   0.243     1.92     6.89
        ================================================
        ID = 3 (  2630):   790.46   4.605     2.83     7.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2630):   790.46   4.605     2.83     7.45
      + ID2= 2 (  0639):     4.60   0.057     1.92     6.89
        ================================================
        ID = 1 (  2630):   795.06   4.631     2.83     7.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH
================================================================================
====================
--------------------------------------------------------------------------------
--------------------
  ***********************************************
  ** SIMULATION : 5 year Fergus Shand Dam Chica **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1436.000
| Ptotal= 51.35 mm |                          B=  11.000
--------------------                          C=   0.854
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

     TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
      hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
     0.00    2.55 |  1.00   15.63 |  2.00    9.04 |  3.00    3.62
     0.08    2.73 |  1.08   25.44 |  2.08    8.05 |  3.08    3.45
     0.17    2.95 |  1.17   57.17 |  2.17    7.25 |  3.17    3.29
     0.25    3.21 |  1.25  134.65 |  2.25    6.59 |  3.25    3.15
     0.33    3.53 |  1.33   71.87 |  2.33    6.04 |  3.33    3.02
     0.42    3.91 |  1.42   42.53 |  2.42    5.57 |  3.42    2.90
     0.50    4.38 |  1.50   29.16 |  2.50    5.17 |  3.50    2.79
     0.58    4.99 |  1.58   21.78 |  2.58    4.83 |  3.58    2.69
     0.67    5.80 |  1.67   17.20 |  2.67    4.52 |  3.67    2.59
     0.75    6.91 |  1.75   14.12 |  2.75    4.26 |  3.75    2.51
     0.83    8.53 |  1.83   11.92 |  2.83    4.02 |  3.83    2.42
     0.92   11.09 |  1.92   10.29 |  2.92    3.81 |  3.92    2.35
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   1.783 (i)
     TIME TO PEAK    (hrs)=   2.917
     RUNOFF VOLUME    (mm)=  13.390
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.261

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.296 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  17.868
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.348

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.69         4.51
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    134.65        48.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=     0.93 (ii)    9.24 (ii)
     Unit Hyd. Tpeak (min)=     5.00        10.00
     Unit Hyd. peak  (cms)=     0.34         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.76         0.40         0.950 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=    49.35        18.37         26.12
     TOTAL RAINFALL   (mm)=    51.35        51.35         51.35
     RUNOFF COEFFICIENT   =     0.96         0.36          0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.296     2.58    17.87
     + ID2= 2 (  0203):     8.20   0.950     1.33    26.12
       ================================================
       ID = 3 (  2200):    22.80   0.962     1.33    20.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.1980      0.2314
                           0.0040      0.0218   |    0.2920      0.2621
                           0.0060      0.0446   |    0.3980      0.2937
                           0.0070      0.0683   |    0.5150      0.3261
                           0.0080      0.0930   |    0.8290      0.3592
                           0.0090      0.1187   |    1.3520      0.3930
                           0.0230      0.1453   |    2.0570      0.4275
                           0.0610      0.1730   |    2.9590      0.4629
                           0.1200      0.2017   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800     0.962      1.33      20.84
   OUTFLOW: ID= 1 (  5200)     22.800     0.276      3.42      20.77

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 28.67
                  TIME SHIFT OF PEAK FLOW         (min)=125.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2568

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.335 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  31.830
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.620

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
```

```
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        48.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    9.24 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.023 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.10
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.335     1.83    31.83
     + ID2= 2 (  0206):     0.20   0.023     1.33    26.10
       ================================================
       ID = 3 (  2201):     5.00   0.342     1.83    31.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.342     1.83    31.60
     + ID2= 2 (  5200):    22.80   0.276     3.42    20.77
       ================================================
       ID = 1 (  2201):    27.80   0.379     1.92    22.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        27.37
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.14 (ii)   13.89 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.11          0.126 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.58
     RUNOFF VOLUME    (mm)=      49.35        15.47          18.18
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.30           0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        48.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    9.24 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.06          0.151 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.11
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
```

```
       ID1= 1 (  0207):     1.30   0.151     1.33    26.11
     + ID2= 2 (  0209):     2.70   0.126     1.58    18.18
       ================================================
       ID = 3 (  2202):     4.00   0.258     1.33    20.76

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.258     1.33    20.76
     + ID2= 2 (  2201):    27.80   0.379     1.92    22.72
       ================================================
       ID = 1 (  2202):    31.80   0.519     1.75    22.47

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   1.783     2.92    13.39
     + ID2= 2 (  2202):    31.80   0.519     1.75    22.47
       ================================================
       ID = 3 (  2100):   168.78   2.159     2.83    15.10

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

    Unit Hyd Qpeak  (cms)=   0.246

    PEAK FLOW       (cms)=   0.100 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=  17.867
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.348

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       1.98         2.42
    Dep. Storage     (mm)=       2.00         5.00
    Average Slope     (%)=       1.00         1.00
    Length            (m)=      25.00        25.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     134.65        48.29
              over (min)         5.00        10.00
    Storage Coeff.  (min)=       0.99 (ii)    9.76 (ii)
    Unit Hyd. Tpeak (min)=       5.00        10.00
    Unit Hyd. peak  (cms)=       0.34         0.11
                                                      *TOTALS*
    PEAK FLOW       (cms)=       0.41         0.21          0.506 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.50           1.33
    RUNOFF VOLUME    (mm)=      49.35        18.37          26.12
    TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
    RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.100     1.92    17.87
     + ID2= 2 (  0304):     4.40   0.506     1.33    26.12
       ================================================
       ID = 3 (  2300):     7.30   0.520     1.33    22.84

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       0.09         0.11
    Dep. Storage     (mm)=       2.00         5.00
    Average Slope     (%)=       1.00         1.00
    Length            (m)=      25.00        25.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     134.65        48.29
              over (min)         5.00        10.00
    Storage Coeff.  (min)=       0.99 (ii)    9.76 (ii)
    Unit Hyd. Tpeak (min)=       5.00        10.00
    Unit Hyd. peak  (cms)=       0.34         0.11
                                                      *TOTALS*
    PEAK FLOW       (cms)=       0.02         0.01          0.023 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.50           1.33
    RUNOFF VOLUME    (mm)=      49.35        18.37          26.09
    TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
    RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        31.72
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       0.93 (ii)   10.76 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.25          0.292 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.50
     RUNOFF VOLUME    (mm)=      49.35        15.47          18.18
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.30           0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.520     1.33    22.84
     + ID2= 2 (  0308):     0.20   0.023     1.33    26.09
       ================================================
       ID = 3 (  2301):     7.50   0.543     1.33    22.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.543     1.33    22.93
     + ID2= 2 (  0310):     5.70   0.292     1.50    18.18
       ================================================
       ID = 1 (  2301):    13.20   0.781     1.33    20.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   2.159     2.83    15.10
     + ID2= 2 (  2301):    13.20   0.781     1.33    20.88
       ================================================
       ID = 3 (  2302):   181.98   2.289     2.75    15.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.90        25.58
               over (min)        15.00        30.00
     Storage Coeff.  (min)=      14.81 (ii)   26.99 (ii)
     Unit Hyd. Tpeak (min)=      15.00        30.00
     Unit Hyd. peak  (cms)=       0.08         0.04
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.40         2.26          2.496 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.92           1.83
     RUNOFF VOLUME    (mm)=      49.35        14.77          15.81
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.29           0.31

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   2.289     2.75    15.52
     + ID2= 2 (  0400):    82.86   2.496     1.83    15.81
       ================================================
       ID = 3 (  2400):   264.84   4.237     1.92    15.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         411.10        0.0550
                 27.30         410.20        0.0550
                 77.50         409.10        0.0550
```

96.60	409.10	0.0550	
115.80	408.90	0.0550	
124.80	409.10	0.0550	
131.00	408.90	0.0550 /0.0350	Main Channel
133.60	408.00	0.0350	Main Channel
134.40	407.60	0.0350	Main Channel
135.00	407.50	0.0350	Main Channel
135.80	407.60	0.0350	Main Channel
136.50	408.00	0.0350	Main Channel
139.40	408.80	0.0350 /0.0550	Main Channel
143.50	408.90	0.0550	
148.50	408.70	0.0550	
163.80	408.90	0.0550	
183.20	408.90	0.0550	
243.70	409.70	0.0550	
278.70	410.20	0.0550	
330.50	411.40	0.0550	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.19	407.69	.366E+03	0.1	0.51	58.83
0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66
3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

		<---- hydrograph ---->				<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (	2400)	264.84	4.24	1.92	15.61	0.99	1.33
OUTFLOW: ID= 1 (	4400)	264.84	3.72	2.42	15.61	0.94	1.29

| CALIB	|		
| NASHYD (0510)|	Area	(ha)= 90.75	Curve Number (CN)= 71.0
|ID= 1 DT= 5.0 min |	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.70	

Unit Hyd Qpeak (cms)= 2.039

PEAK FLOW (cms)= 0.961 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 14.315
TOTAL RAINFALL (mm)= 51.355
RUNOFF COEFFICIENT = 0.279

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ROUTE CHN(4510)|	
| IN= 2---> OUT= 1 |	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350 /0.0350	Main Channel
8.20	414.20	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00

```
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN

     **** WARNING:  INFLOW HYDROGRAPH IS DRY!!

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0511)|   Area    (ha)=  54.65   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.52

     Unit Hyd Qpeak  (cms)=   4.014

     PEAK FLOW       (cms)=   1.340 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  14.315
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.279

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0516)|   Area    (ha)=  11.47   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.56

     Unit Hyd Qpeak  (cms)=   0.782

     PEAK FLOW       (cms)=   0.268 (i)
     TIME TO PEAK    (hrs)=   2.083
     RUNOFF VOLUME    (mm)=  14.315
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.279

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4516)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70        0.0350      Main Channel
                   8.60         414.20        0.0350      Main Channel

          <--------------------- TRAVEL TIME TABLE ---------------------->
           DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
            (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
           0.08   412.78    .125E+02       0.0          0.27       43.74
           0.16   412.86    .500E+02       0.0          0.42       27.55
           0.24   412.94    .113E+03       0.1          0.55       21.03
           0.32   413.02    .200E+03       0.2          0.67       17.36
           0.39   413.09    .313E+03       0.3          0.78       14.96
           0.47   413.17    .450E+03       0.6          0.88       13.25
           0.55   413.25    .613E+03       0.9          0.98       11.95
           0.63   413.33    .801E+03       1.2          1.07       10.93
           0.71   413.41    .101E+04       1.7          1.15       10.11
           0.79   413.49    .125E+04       2.2          1.24        9.42
           0.87   413.57    .151E+04       2.9          1.32        8.84
           0.95   413.65    .180E+04       3.6          1.40        8.34
           1.03   413.73    .211E+04       4.5          1.47        7.91
           1.11   413.81    .245E+04       5.4          1.55        7.53
           1.18   413.88    .281E+04       6.5          1.62        7.19
           1.26   413.96    .320E+04       7.7          1.69        6.89
           1.34   414.04    .362E+04       9.1          1.76        6.62
           1.42   414.12    .405E+04      10.6          1.83        6.37
           1.50   414.20    .452E+04      12.3          1.90        6.14

                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0516)   11.47     0.27    2.08  14.31      0.35      0.72
   OUTFLOW: ID= 1 (  4516)   11.47     0.24    2.33  14.29      0.34      0.70

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4516):    11.47   0.243     2.33    14.29
     + ID2= 2 (  0511):    54.65   1.340     2.00    14.31
       ================================================
       ID = 3 (  2510):    66.12   1.553     2.08    14.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   1.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.058 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  14.311
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.279

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
-------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):    66.12   1.553     2.08    14.31
     + ID2= 2 (  4510):    90.75   0.961     3.58    14.32
       ================================================
       ID = 3 (  2511):   156.87   2.005     2.25    14.31

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD  (  2511)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2511):   156.87   2.005     2.25    14.31
     + ID2= 2 (  0517):     1.75   0.058     1.75    14.31
       ================================================
       ID = 1 (  2511):   158.62   2.039     2.25    14.31

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| CALIB           |
| NASHYD   (  0512)|   Area    (ha)=  31.10   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.71

    Unit Hyd Qpeak  (cms)=   1.673

    PEAK FLOW       (cms)=   0.619 (i)
    TIME TO PEAK    (hrs)=   2.250
    RUNOFF VOLUME    (mm)=  14.315
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.279

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB           |
| NASHYD   (  0514)|   Area    (ha)=   2.65   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.60

    Unit Hyd Qpeak  (cms)=   0.169

    PEAK FLOW       (cms)=   0.048 (i)
    TIME TO PEAK    (hrs)=   2.167
    RUNOFF VOLUME    (mm)=  11.733
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.228

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB           |
| NASHYD   (  0515)|   Area    (ha)=   5.41   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

    Unit Hyd Qpeak  (cms)=   0.504

    PEAK FLOW       (cms)=   0.125 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=  11.732
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.228

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB           |
| NASHYD   (  0513)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

    Unit Hyd Qpeak  (cms)=   1.276

    PEAK FLOW       (cms)=   0.288 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=  14.288
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.278

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2511):   158.62   2.039     2.25    14.31
     + ID2= 2 (  0512):    31.10   0.619     2.25    14.32
       ================================================
       ID = 3 (  2512):   189.72   2.658     2.25    14.31

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   189.72   2.658     2.25    14.31
     + ID2= 2 (  0513):     6.68   0.288     1.58    14.29
       ================================================
       ID = 1 (  2512):   196.40   2.749     2.25    14.31

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   196.40   2.749     2.25    14.31
     + ID2= 2 (  0514):     2.65   0.048     2.17    11.73
       ================================================
       ID = 3 (  2512):   199.05   2.796     2.25    14.28

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   199.05   2.796     2.25    14.28
     + ID2= 2 (  0515):     5.41   0.125     1.92    11.73
       ================================================
       ID = 1 (  2512):   204.46   2.902     2.17    14.21

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   204.46   2.902     2.17    14.21
     + ID2= 2 (  4400):   264.84   3.723     2.42    15.61
       ================================================
       ID = 3 (  2513):   469.30   6.565     2.33    15.00

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.20

    Unit Hyd Qpeak  (cms)=   3.449

    PEAK FLOW       (cms)=   1.486 (i)
    TIME TO PEAK    (hrs)=   2.917
    RUNOFF VOLUME    (mm)=  14.315
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.279

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   469.30   6.565     2.33    15.00
     + ID2= 2 (  0520):   108.36   1.486     2.92    14.32
       ================================================
       ID = 3 (  2520):   577.66   7.835     2.42    14.87

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
             <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                0.00         409.70        0.0550
               19.70         408.80        0.0550
               41.70         407.20        0.0550
               60.50         405.30        0.0550
               80.00         404.50        0.0550
               95.70         404.60    0.0550 /0.0350  Main Channel
               98.60         403.40        0.0350      Main Channel
              100.40         403.40        0.0350      Main Channel
              100.80         402.90        0.0350      Main Channel
              101.50         402.70        0.0350      Main Channel
              102.30         402.80        0.0350      Main Channel
              103.30         403.20        0.0350      Main Channel
              104.00         403.20        0.0350      Main Channel
              105.60         404.40    0.0350 /0.0550  Main Channel
              109.70         404.30        0.0550
              128.60         404.20        0.0550
              154.10         405.40        0.0550
              179.10         406.70        0.0550
              201.90         408.60        0.0550
              224.20         410.60        0.0550

          <---------------------- TRAVEL TIME TABLE ---------------------->
           DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
            (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
           0.34    403.04    .954E+03       0.3          0.70      47.40
           0.68    403.38    .304E+04       1.6          1.03      32.27
           1.02    403.72    .718E+04       4.5          1.25      26.57
           1.36    404.06    .122E+05       9.7          1.58      20.96
           1.70    404.40    .251E+05      18.1          1.44      23.04
           2.08    404.78    .650E+05      42.3          1.29      25.62
           2.46    405.16    .122E+06      86.3          1.40      23.62
           2.84    405.54    .192E+06     151.6          1.57      21.10
           3.21    405.91    .270E+06     238.3          1.75      18.90
           3.59    406.29    .357E+06     345.8          1.93      17.20
           3.97    406.67    .452E+06     474.9          2.09      15.85
           4.35    407.05    .554E+06     631.1          2.26      14.63
           4.73    407.43    .663E+06     807.8          2.42      13.67
           5.11    407.81    .779E+06    1006.4          2.57      12.89
           5.49    408.19    .902E+06    1229.0          2.71      12.23
           5.86    408.56    .103E+07    1476.4          2.84      11.66
           6.24    408.94    .117E+07    1745.6          2.96      11.18
           6.62    409.32    .132E+07    2034.5          3.07      10.79
           7.00    409.70    .147E+07    2353.2          3.17      10.44
```

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2520)	577.66	7.84	2.42	14.87	1.24	1.44
OUTFLOW: ID= 1 (4500)	577.66	7.28	2.83	14.87	1.20	1.40

```
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

    Unit Hyd Qpeak  (cms)=   2.981

    PEAK FLOW       (cms)=   1.221 (i)
    TIME TO PEAK    (hrs)=   2.667
    RUNOFF VOLUME    (mm)=  14.315
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.279
```

```
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   577.66   7.279     2.83    14.87
     + ID2= 2 (  0610):    78.05   1.221     2.67    14.32
       ================================================
       ID = 3 (  2610):   655.71   8.482     2.83    14.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   0.504 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.191 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.842
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  0.00         414.20        0.0360      Main Channel
                  4.30         412.70        0.0360      Main Channel
                  8.60         414.20        0.0360      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .108E+02       0.0          0.24      42.13
        0.16   412.86    .434E+02       0.0          0.38      26.54
        0.24   412.94    .976E+02       0.1          0.50      20.26
        0.32   413.02    .174E+03       0.2          0.61      16.72
        0.39   413.09    .271E+03       0.3          0.70      14.41
        0.47   413.17    .390E+03       0.5          0.79      12.76
        0.55   413.25    .532E+03       0.8          0.88      11.51
        0.63   413.33    .694E+03       1.1          0.96      10.53
        0.71   413.41    .879E+03       1.5          1.04       9.74
        0.79   413.49    .108E+04       2.0          1.11       9.08
        0.87   413.57    .131E+04       2.6          1.19       8.52
        0.95   413.65    .156E+04       3.2          1.26       8.04
        1.03   413.73    .183E+04       4.0          1.33       7.62
        1.11   413.81    .213E+04       4.9          1.39       7.25
        1.18   413.88    .244E+04       5.9          1.46       6.93
        1.26   413.96    .278E+04       7.0          1.52       6.64
        1.34   414.04    .313E+04       8.2          1.59       6.37
        1.42   414.12    .351E+04       9.5          1.65       6.13
        1.50   414.20    .392E+04      11.0          1.71       5.92

                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0625)    6.72     0.19    1.83  13.84      0.33      0.62
   OUTFLOW: ID= 1 (  4625)    6.72     0.16    2.08  13.81      0.31      0.59


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.289 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.841
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.193 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.842
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
-------------------
| CALIB           |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.284 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.64         0.42
     Dep. Storage     (mm)=      1.00        10.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     84.06        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    134.65        28.38
                over (min)       5.00        15.00
     Storage Coeff.  (min)=      2.04 (ii)   13.72 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.31         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.19         0.02          0.192 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=     50.35        14.41          32.37
     TOTAL RAINFALL   (mm)=     51.35        51.35          51.35
     RUNOFF COEFFICIENT   =      0.98         0.28           0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.163     2.08    13.81
     + ID2= 2 (  0621):     6.56   0.193     1.83    13.84
       ================================================
       ID = 3 (  2621):    13.28   0.336     2.00    13.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    13.28   0.336     2.00    13.83
     + ID2= 2 (  0622):     9.69   0.289     1.83    13.84
       ================================================
       ID = 1 (  2621):    22.97   0.616     1.92    13.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    22.97   0.616     1.92    13.83
     + ID2= 2 (  0623):    19.37   0.504     1.92    13.84
       ================================================
       ID = 3 (  2621):    42.34   1.119     1.92    13.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    42.34   1.119     1.92    13.84
     + ID2= 2 (  0624):    11.84   0.284     2.00    13.84
       ================================================
       ID = 1 (  2621):    54.18   1.398     1.92    13.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    54.18   1.398     1.92    13.84
     + ID2= 2 (  0626):     1.06   0.192     1.33    32.37
       ================================================
       ID = 3 (  2621):    55.24   1.430     1.92    14.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.391 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  13.818
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.269

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  6200)|   Area    (ha)=   6.66   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

     Unit Hyd Qpeak  (cms)=   0.908

     PEAK FLOW       (cms)=   0.267 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  15.838
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.308

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  6201)|   Area    (ha)=   0.82   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.046 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  15.755
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.307

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6200):     6.66   0.267     1.67    15.84
     + ID2= 2 (  6201):     0.82   0.046     1.50    15.75
       ================================================
       ID = 3 (  0113):     7.48   0.303     1.67    15.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0         0.55       7.70
       0.16   412.86    .182E+02       0.1         0.88       4.85
       0.24   412.94    .410E+02       0.2         1.15       3.70
       0.32   413.02    .729E+02       0.4         1.39       3.05
       0.39   413.09    .114E+03       0.7         1.61       2.63
       0.47   413.17    .164E+03       1.2         1.82       2.33
       0.55   413.25    .223E+03       1.8         2.02       2.10
       0.63   413.33    .292E+03       2.5         2.21       1.92
       0.71   413.41    .369E+03       3.5         2.39       1.78
       0.79   413.49    .456E+03       4.6         2.56       1.66
       0.87   413.57    .551E+03       5.9         2.73       1.56
       0.95   413.65    .656E+03       7.4         2.89       1.47
       1.03   413.73    .770E+03       9.2         3.05       1.39
       1.11   413.81    .893E+03      11.2         3.21       1.32
       1.18   413.88    .103E+04      13.5         3.36       1.27
       1.26   413.96    .117E+04      16.0         3.51       1.21
       1.34   414.04    .132E+04      18.9         3.65       1.16
       1.42   414.12    .148E+04      22.0         3.79       1.12
       1.50   414.20    .165E+04      25.4         3.93       1.08

                                    <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
  INFLOW : ID= 2 (  0113)    7.48     0.30    1.67  15.83     0.28      1.27
  OUTFLOW: ID= 1 (  4620)    7.48     0.30    1.75  15.83     0.28      1.26


--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4620):     7.48   0.299     1.75    15.83
     + ID2= 2 (  0627):     9.39   0.391     1.58    13.82
       ================================================
       ID = 3 (  2620):    16.87   0.668     1.67    14.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):    16.87   0.668     1.67    14.71
     + ID2= 2 (  2621):    55.24   1.430     1.92    14.19
       ================================================
       ID = 3 (  2622):    72.11   1.967     1.83    14.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2623)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2610):   655.71   8.482     2.83    14.81
     + ID2= 2 (  2622):    72.11   1.967     1.83    14.31
       ================================================
       ID = 3 (  2623):   727.82   9.302     2.75    14.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
```

```
| CALIB           |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679

     PEAK FLOW       (cms)=   0.211 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   0.956 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.842
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17      47.72
       0.16   412.86    .357E+02       0.0          0.28      30.06
       0.24   412.94    .804E+02       0.1          0.36      22.94
       0.32   413.02    .143E+03       0.1          0.44      18.94
       0.39   413.09    .223E+03       0.2          0.51      16.32
       0.47   413.17    .322E+03       0.4          0.58      14.45
       0.55   413.25    .438E+03       0.6          0.64      13.04
       0.63   413.33    .572E+03       0.8          0.70      11.93
       0.71   413.41    .724E+03       1.1          0.76      11.03
       0.79   413.49    .893E+03       1.4          0.81      10.28
       0.87   413.57    .108E+04       1.9          0.86       9.65
       0.95   413.65    .129E+04       2.4          0.92       9.10
       1.03   413.73    .151E+04       2.9          0.97       8.63
       1.11   413.81    .175E+04       3.6          1.01       8.22
       1.18   413.88    .201E+04       4.3          1.06       7.85
       1.26   413.96    .229E+04       5.1          1.11       7.52
       1.34   414.04    .258E+04       6.0          1.15       7.22
       1.42   414.12    .289E+04       6.9          1.20       6.95
       1.50   414.20    .323E+04       8.0          1.24       6.70

                                  <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     0.96    1.83  13.84      0.67      0.73
   OUTFLOW: ID= 1 (  4630)   33.04     0.87    2.00  13.83      0.65      0.71

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2623):   727.82   9.302     2.75    14.76
     + ID2= 2 (  4630):    33.04   0.866     2.00    13.83
       ================================================
       ID = 3 (  2637):   760.86   9.800     2.67    14.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   760.86   9.800     2.67    14.72
     + ID2= 2 (  0637):     8.36   0.211     2.00    13.84
       ================================================
       ID = 1 (  2637):   769.22   9.921     2.58    14.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.083 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   769.22   9.921     2.58    14.71
     + ID2= 2 (  0636):     3.32   0.083     2.00    13.84
       ================================================
       ID = 3 (  2636):   772.54   9.974     2.58    14.70
```

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.123 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   0.528 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2636):   772.54   9.974     2.58    14.70
      + ID2= 2 (  0638):    20.63   0.528     1.92    13.84
        ================================================
        ID = 3 (  2630):   793.17  10.297     2.58    14.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2630):   793.17  10.297     2.58    14.68
      + ID2= 2 (  0639):     4.60   0.123     1.92    13.84
        ================================================
        ID = 1 (  2630):   797.77  10.366     2.58    14.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH
```

```
================================================================================
====================
--------------------------------------------------------------------------------
--------------------
  ********************************************
  ** SIMULATION : 10 year Fergus Shand Dam Chic **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2126.000
| Ptotal= 61.34 mm |                          B=  15.000
--------------------                          C=   0.890
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

    TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
     hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
    0.00    2.71 |  1.00   19.98 |  2.00   11.15 |  3.00    4.04
    0.08    2.94 |  1.08   32.79 |  2.08    9.83 |  3.08    3.82
    0.17    3.21 |  1.17   70.46 |  2.17    8.76 |  3.17    3.63
    0.25    3.53 |  1.25  147.79 |  2.25    7.89 |  3.25    3.45
    0.33    3.92 |  1.33   87.01 |  2.33    7.16 |  3.33    3.29
    0.42    4.40 |  1.42   53.99 |  2.42    6.55 |  3.42    3.14
    0.50    5.01 |  1.50   37.57 |  2.50    6.03 |  3.50    3.01
    0.58    5.79 |  1.58   28.09 |  2.58    5.58 |  3.58    2.89
    0.67    6.84 |  1.67   22.06 |  2.67    5.19 |  3.67    2.77
    0.75    8.31 |  1.75   17.96 |  2.75    4.84 |  3.75    2.67
    0.83   10.47 |  1.83   15.02 |  2.83    4.54 |  3.83    2.57
    0.92   13.90 |  1.92   12.83 |  2.92    4.27 |  3.92    2.48


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   2.536 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  18.624
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.304

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.407 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  24.021
```

```
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    8.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.84         0.56          1.115 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.49
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.407     2.58    24.02
     + ID2= 2 (  0203):     8.20   1.115     1.33    33.49
       ================================================
       ID = 3 (  2200):    22.80   1.131     1.33    27.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000      0.0000   |    0.1980      0.2314
                         0.0040      0.0218   |    0.2920      0.2621
                         0.0060      0.0446   |    0.3980      0.2937
                         0.0070      0.0683   |    0.5150      0.3261
                         0.0080      0.0930   |    0.8290      0.3592
                         0.0090      0.1187   |    1.3520      0.3930
                         0.0230      0.1453   |    2.0570      0.4275
                         0.0610      0.1730   |    2.9590      0.4629
                         0.1200      0.2017   |    0.0000      0.0000

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.131      1.33      27.43
   OUTFLOW: ID= 1 (  5200)     22.800      0.410      3.17      27.37

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 36.23
                  TIME SHIFT OF PEAK FLOW         (min)=110.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2970

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.433 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.661
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.663

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    8.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.027 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.46
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.433     1.83    40.66
     + ID2= 2 (  0206):     0.20   0.027     1.33    33.46
       ================================================
       ID = 3 (  2201):     5.00   0.443     1.83    40.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.443     1.83    40.37
     + ID2= 2 (  5200):    22.80   0.410     3.17    27.37
       ================================================
       ID = 1 (  2201):    27.80   0.579     2.00    29.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        37.22
               over (min)=       5.00        15.00
     Storage Coeff.  (min)=       1.10 (ii)   12.38 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.16          0.181 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.58
     RUNOFF VOLUME    (mm)=      59.34        21.28          24.32
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.35           0.40

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.41
               over (min)=       5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    8.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.09          0.177 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.49
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.177     1.33    33.49
     + ID2= 2 (  0209):     2.70   0.181     1.58    24.32
       ================================================
       ID = 3 (  2202):     4.00   0.313     1.50    27.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.313     1.50    27.30
     + ID2= 2 (  2201):    27.80   0.579     2.00    29.70
       ================================================
       ID = 1 (  2202):    31.80   0.740     1.83    29.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   2.536     2.83    18.62
     + ID2= 2 (  2202):    31.80   0.740     1.83    29.40
       ================================================
       ID = 3 (  2100):   168.78   3.097     2.83    20.65
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0302)	Area (ha)=	2.90	Curve Number (CN)= 74.0
ID= 1 DT= 5.0 min	Ia (mm)=	1.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.45	

Unit Hyd Qpeak (cms)= 0.246

PEAK FLOW (cms)= 0.138 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 24.019
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.392

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0304)	Area (ha)=	4.40	
ID= 1 DT= 5.0 min	Total Imp(%)=	45.00	Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.98	2.42	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	1.00	1.00	
Length	(m)=	25.00	25.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		147.79	63.41	
over (min)		5.00	10.00	
Storage Coeff. (min)=		0.95 (ii)	8.82 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.34	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.45	0.29	0.593 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	59.34	24.87	33.49
TOTAL RAINFALL	(mm)=	61.34	61.34	61.34
RUNOFF COEFFICIENT	=	0.97	0.41	0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2300)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0302):		2.90	0.138	1.92	24.02
+ ID2= 2 (0304):		4.40	0.593	1.33	33.49
ID = 3 (2300):		7.30	0.613	1.33	29.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0308)	Area (ha)=	0.20	
ID= 1 DT= 5.0 min	Total Imp(%)=	45.00	Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.09	0.11	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	1.00	1.00	
Length	(m)=	25.00	25.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		147.79	63.41	
over (min)		5.00	10.00	
Storage Coeff. (min)=		0.95 (ii)	8.82 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.34	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.02	0.01	0.027 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	59.34	24.87	33.47
TOTAL RAINFALL	(mm)=	61.34	61.34	61.34
RUNOFF COEFFICIENT	=	0.97	0.41	0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0310)	Area (ha)=	5.70	
ID= 1 DT= 5.0 min	Total Imp(%)=	16.00	Dir. Conn.(%)= 8.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.91	4.79	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	1.20	1.20	
Length	(m)=	25.00	25.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		147.79	42.42	
over (min)		5.00	10.00	
Storage Coeff. (min)=		0.90 (ii)	9.64 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.34	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.19	0.38	0.447 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.50
RUNOFF VOLUME	(mm)=	59.34	21.28	24.32
TOTAL RAINFALL	(mm)=	61.34	61.34	61.34
RUNOFF COEFFICIENT	=	0.97	0.35	0.40

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

```
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2300):     7.30   0.613     1.33    29.73
      + ID2= 2 (  0308):     0.20   0.027     1.33    33.47
        ================================================
        ID = 3 (  2301):     7.50   0.640     1.33    29.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2301):     7.50   0.640     1.33    29.83
      + ID2= 2 (  0310):     5.70   0.447     1.50    24.32
        ================================================
        ID = 1 (  2301):    13.20   1.046     1.42    27.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2100):   168.78   3.097     2.83    20.65
      + ID2= 2 (  2301):    13.20   1.046     1.42    27.45
        ================================================
        ID = 3 (  2302):   181.98   3.268     2.75    21.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      8.29        74.57
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      0.70         2.00
     Length            (m)=   1437.00        40.00
     Mannings n          =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    101.75        34.92
               over (min)       15.00        25.00
     Storage Coeff.  (min)=    13.97 (ii)   24.72 (ii)
     Unit Hyd. Tpeak (min)=      15.00        25.00
     Unit Hyd. peak  (cms)=       0.08         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.48         3.39         3.711 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.83          1.75
     RUNOFF VOLUME    (mm)=      59.34        20.39         21.56
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.97         0.33          0.35

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2302):   181.98   3.268     2.75    21.15
      + ID2= 2 (  0400):    82.86   3.711     1.75    21.56
        ================================================
        ID = 3 (  2400):   264.84   6.060     1.83    21.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         411.10        0.0550
                 27.30         410.20        0.0550
                 77.50         409.10        0.0550
                 96.60         409.10        0.0550
                115.80         408.90        0.0550
                124.80         409.10        0.0550
                131.00         408.90    0.0550 /0.0350  Main Channel
                133.60         408.00        0.0350      Main Channel
                134.40         407.60        0.0350      Main Channel
                135.00         407.50        0.0350      Main Channel
                135.80         407.60        0.0350      Main Channel
                136.50         408.00        0.0350      Main Channel
                139.40         408.80    0.0350 /0.0550  Main Channel
                143.50         408.90        0.0550
                148.50         408.70        0.0550
                163.80         408.90        0.0550
                183.20         408.90        0.0550
                243.70         409.70        0.0550
                278.70         410.20        0.0550
                330.50         411.40        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.19   407.69    .366E+03       0.1          0.51      58.83
      0.37   407.87    .106E+04       0.5          0.81      37.08
      0.56   408.06    .199E+04       1.1          1.00      29.93
      0.74   408.24    .328E+04       2.1          1.14      26.32
      0.93   408.43    .498E+04       3.6          1.28      23.32
      1.11   408.61    .708E+04       5.6          1.43      20.94
      1.30   408.80    .105E+05       8.5          1.45      20.61
      1.49   408.99    .247E+05      14.8          1.07      27.91
```

```
      1.68   409.18    .601E+05      30.4          0.91      32.97
      1.87   409.37    .109E+06      58.5          0.96      31.05
      2.06   409.56    .166E+06      98.3          1.06      28.11
      2.25   409.75    .231E+06     150.3          1.17      25.57
      2.44   409.94    .303E+06     215.4          1.28      23.46
      2.64   410.14    .383E+06     293.8          1.38      21.74
      2.83   410.33    .470E+06     390.1          1.49      20.10
      3.02   410.52    .563E+06     502.4          1.60      18.66
      3.21   410.71    .660E+06     628.8          1.71      17.48
      3.40   410.90    .762E+06     769.5          1.81      16.49
      3.59   411.09    .868E+06     924.9          1.91      15.65

                                <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84     6.06    1.83  21.28      1.14      1.43
   OUTFLOW: ID= 1 (  4400)  264.84     5.34    2.33  21.28      1.09      1.41



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  90.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.70

     Unit Hyd Qpeak  (cms)=   2.039

     PEAK FLOW       (cms)=   1.351 (i)
     TIME TO PEAK    (hrs)=   3.500
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70    0.0350 /0.0350  Main Channel
                   8.20         414.20        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00
```

```
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  19.829
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0516)|   Area    (ha)=  11.47   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.56

     Unit Hyd Qpeak  (cms)=   0.782

     PEAK FLOW       (cms)=   0.382 (i)
     TIME TO PEAK    (hrs)=   2.083
     RUNOFF VOLUME    (mm)=  19.829
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4516)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .125E+02       0.0          0.27      43.74
       0.16   412.86    .500E+02       0.0          0.42      27.55
       0.24   412.94    .113E+03       0.1          0.55      21.03
       0.32   413.02    .200E+03       0.2          0.67      17.36
       0.39   413.09    .313E+03       0.3          0.78      14.96
       0.47   413.17    .450E+03       0.6          0.88      13.25
       0.55   413.25    .613E+03       0.9          0.98      11.95
       0.63   413.33    .801E+03       1.2          1.07      10.93
       0.71   413.41    .101E+04       1.7          1.15      10.11
       0.79   413.49    .125E+04       2.2          1.24       9.42
       0.87   413.57    .151E+04       2.9          1.32       8.84
       0.95   413.65    .180E+04       3.6          1.40       8.34
       1.03   413.73    .211E+04       4.5          1.47       7.91
       1.11   413.81    .245E+04       5.4          1.55       7.53
       1.18   413.88    .281E+04       6.5          1.62       7.19
       1.26   413.96    .320E+04       7.7          1.69       6.89
       1.34   414.04    .362E+04       9.1          1.76       6.62
       1.42   414.12    .405E+04      10.6          1.83       6.37
       1.50   414.20    .452E+04      12.3          1.90       6.14

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0516)   11.47     0.38    2.08  19.83      0.41      0.79
   OUTFLOW: ID= 1 (  4516)   11.47     0.35    2.33  19.81      0.40      0.78

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4516):    11.47   0.353     2.33    19.81
     + ID2= 2 (  0511):    54.65   1.908     2.00    19.83
       ================================================
       ID = 3 (  2510):    66.12   2.222     2.08    19.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   1.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.083 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  19.824
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):    66.12   2.222     2.08    19.83
     + ID2= 2 (  4510):    90.75   1.351     3.50    19.83
       ================================================
       ID = 3 (  2511):   156.87   2.865     2.25    19.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2511):   156.87   2.865     2.25    19.83
     + ID2= 2 (  0517):     1.75   0.083     1.75    19.82
       ================================================
       ID = 1 (  2511):   158.62   2.913     2.25    19.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0512)|   Area    (ha)=  31.10   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.71
```

```
     Unit Hyd Qpeak  (cms)=   1.673

     PEAK FLOW       (cms)=   0.881 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0514)|   Area    (ha)=   2.65   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.60

     Unit Hyd Qpeak  (cms)=   0.169

     PEAK FLOW       (cms)=   0.069 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  16.438
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.268

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.41   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.504

     PEAK FLOW       (cms)=   0.180 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  16.437
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.268

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0513)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.405 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.792
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2511):   158.62   2.913     2.25    19.83
     + ID2= 2 (  0512):    31.10   0.881     2.25    19.83
       ================================================
       ID = 3 (  2512):   189.72   3.794     2.25    19.83

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   189.72   3.794     2.25    19.83
     + ID2= 2 (  0513):     6.68   0.405     1.58    19.79
       ================================================
       ID = 1 (  2512):   196.40   3.922     2.25    19.83

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   196.40   3.922     2.25    19.83
     + ID2= 2 (  0514):     2.65   0.069     2.17    16.44
       ================================================
       ID = 3 (  2512):   199.05   3.991     2.17    19.78

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   199.05   3.991     2.17    19.78
     + ID2= 2 (  0515):     5.41   0.180     1.92    16.44
       ================================================
       ID = 1 (  2512):   204.46   4.146     2.17    19.69

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   204.46   4.146     2.17    19.69
     + ID2= 2 (  4400):   264.84   5.341     2.33    21.28
       ================================================
       ID = 3 (  2513):   469.30   9.460     2.25    20.59

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
```

```
--------------------  U.H. Tp(hrs)=   1.20

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   2.103 (i)
     TIME TO PEAK    (hrs)=   2.917
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   469.30   9.460     2.25    20.59
     + ID2= 2 (  0520):   108.36   2.103     2.92    19.83
       ================================================
       ID = 3 (  2520):   577.66  11.180     2.33    20.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         409.70        0.0550
                 19.70         408.80        0.0550
                 41.70         407.20        0.0550
                 60.50         405.30        0.0550
                 80.00         404.50        0.0550
                 95.70         404.60    0.0550 /0.0350  Main Channel
                 98.60         403.40        0.0350      Main Channel
                100.40         403.40        0.0350      Main Channel
                100.80         402.90        0.0350      Main Channel
                101.50         402.70        0.0350      Main Channel
                102.30         402.80        0.0350      Main Channel
                103.30         403.20        0.0350      Main Channel
                104.00         403.20        0.0350      Main Channel
                105.60         404.40    0.0350 /0.0550  Main Channel
                109.70         404.30        0.0550
                128.60         404.20        0.0550
                154.10         405.40        0.0550
                179.10         406.70        0.0550
                201.90         408.60        0.0550
                224.20         410.60        0.0550

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.34   403.04    .954E+03       0.3          0.70      47.40
      0.68   403.38    .304E+04       1.6          1.03      32.27
      1.02   403.72    .718E+04       4.5          1.25      26.57
      1.36   404.06    .122E+05       9.7          1.58      20.96
      1.70   404.40    .251E+05      18.1          1.44      23.04
      2.08   404.78    .650E+05      42.3          1.29      25.62
      2.46   405.16    .122E+06      86.3          1.40      23.62
      2.84   405.54    .192E+06     151.6          1.57      21.10
      3.21   405.91    .270E+06     238.3          1.75      18.90
      3.59   406.29    .357E+06     345.8          1.93      17.20
      3.97   406.67    .452E+06     474.9          2.09      15.85
      4.35   407.05    .554E+06     631.1          2.26      14.63
      4.73   407.43    .663E+06     807.8          2.42      13.67
      5.11   407.81    .779E+06    1006.4          2.57      12.89
      5.49   408.19    .902E+06    1229.0          2.71      12.23
      5.86   408.56    .103E+07    1476.4          2.84      11.66
      6.24   408.94    .117E+07    1745.6          2.96      11.18
      6.62   409.32    .132E+07    2034.5          3.07      10.79
      7.00   409.70    .147E+07    2353.2          3.17      10.44

                                  <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  2520)  577.66    11.18    2.33  20.44      1.42      1.55
  OUTFLOW: ID= 1 (  4500)  577.66    10.48    2.83  20.44      1.39      1.57


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   1.733 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   577.66  10.482     2.83    20.44
     + ID2= 2 (  0610):    78.05   1.733     2.67    19.83
       ================================================
       ID = 3 (  2610):   655.71  12.194     2.75    20.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   0.718 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  19.215
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313
```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0625)	Area (ha)=	6.72	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.39			

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.272 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 19.214
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4625)		
IN= 2---> OUT= 1	Routing time step (min)'=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0360	Main Channel
4.30	412.70	0.0360	Main Channel
8.60	414.20	0.0360	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.108E+02	0.0	0.24	42.13
0.16	412.86	.434E+02	0.0	0.38	26.54
0.24	412.94	.976E+02	0.1	0.50	20.26
0.32	413.02	.174E+03	0.2	0.61	16.72
0.39	413.09	.271E+03	0.3	0.70	14.41
0.47	413.17	.390E+03	0.5	0.79	12.76
0.55	413.25	.532E+03	0.8	0.88	11.51
0.63	413.33	.694E+03	1.1	0.96	10.53
0.71	413.41	.879E+03	1.5	1.04	9.74
0.79	413.49	.108E+04	2.0	1.11	9.08
0.87	413.57	.131E+04	2.6	1.19	8.52
0.95	413.65	.156E+04	3.2	1.26	8.04
1.03	413.73	.183E+04	4.0	1.33	7.62
1.11	413.81	.213E+04	4.9	1.39	7.25
1.18	413.88	.244E+04	5.9	1.46	6.93
1.26	413.96	.278E+04	7.0	1.52	6.64
1.34	414.04	.313E+04	8.2	1.59	6.37
1.42	414.12	.351E+04	9.5	1.65	6.13
1.50	414.20	.392E+04	11.0	1.71	5.92

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0625)	6.72	0.27	1.83	19.21	0.37	0.67
OUTFLOW: ID= 1 (4625)	6.72	0.24	2.08	19.18	0.35	0.65

CALIB					
NASHYD (0622)	Area (ha)=	9.69	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.36			

Unit Hyd Qpeak (cms)= 1.028

PEAK FLOW (cms)= 0.412 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 19.213
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0621)	Area (ha)=	6.56	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.37			

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.274 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 19.213
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0624)	Area (ha)=	11.84	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.51			

Unit Hyd Qpeak (cms)= 0.887

PEAK FLOW (cms)= 0.405 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 19.216
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0626)	Area (ha)=	1.06			
ID= 1 DT= 5.0 min	Total Imp(%)=	60.00	Dir. Conn.(%)=	50.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.64	0.42
Dep. Storage (mm)=	1.00	10.00
Average Slope (%)=	1.00	2.00
Length (m)=	84.06	40.00
Mannings n =	0.013	0.250

```
     Max.Eff.Inten.(mm/hr)=     147.79        45.03
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.97 (ii)   11.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.31         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.03          0.215 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      60.34        20.26          40.30
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.98         0.33           0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.236     2.08    19.18
     + ID2= 2 (  0621):     6.56   0.274     1.83    19.21
       ================================================
       ID = 3 (  2621):    13.28   0.487     1.92    19.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    13.28   0.487     1.92    19.20
     + ID2= 2 (  0622):     9.69   0.412     1.83    19.21
       ================================================
       ID = 1 (  2621):    22.97   0.887     1.92    19.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    22.97   0.887     1.92    19.20
     + ID2= 2 (  0623):    19.37   0.718     1.92    19.22
       ================================================
       ID = 3 (  2621):    42.34   1.604     1.92    19.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    42.34   1.604     1.92    19.21
     + ID2= 2 (  0624):    11.84   0.405     2.00    19.22
       ================================================
       ID = 1 (  2621):    54.18   2.001     1.92    19.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    54.18   2.001     1.92    19.21
     + ID2= 2 (  0626):     1.06   0.215     1.33    40.30
       ================================================
       ID = 3 (  2621):    55.24   2.045     1.92    19.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.550 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.180
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  6200)|   Area    (ha)=   6.66   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

     Unit Hyd Qpeak  (cms)=   0.908

     PEAK FLOW       (cms)=   0.374 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  21.794
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.355

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  6201)|   Area    (ha)=   0.82   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.063 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  21.679
```

```
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.353

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  6200):     6.66   0.374     1.67    21.79
      + ID2= 2 (  6201):     0.82   0.063     1.50    21.68
        ================================================
        ID = 3 (  0113):     7.48   0.425     1.67    21.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55       7.70
       0.16   412.86    .182E+02       0.1          0.88       4.85
       0.24   412.94    .410E+02       0.2          1.15       3.70
       0.32   413.02    .729E+02       0.4          1.39       3.05
       0.39   413.09    .114E+03       0.7          1.61       2.63
       0.47   413.17    .164E+03       1.2          1.82       2.33
       0.55   413.25    .223E+03       1.8          2.02       2.10
       0.63   413.33    .292E+03       2.5          2.21       1.92
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0113)    7.48     0.42    1.67  21.78      0.32      1.41
   OUTFLOW: ID= 1 (  4620)    7.48     0.42    1.67  21.78      0.32      1.41
```

```
--------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  4620):     7.48   0.422     1.67    21.78
      + ID2= 2 (  0627):     9.39   0.550     1.58    19.18
        ================================================
        ID = 3 (  2620):    16.87   0.947     1.67    20.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2620):    16.87   0.947     1.67    20.33
      + ID2= 2 (  2621):    55.24   2.045     1.92    19.61
        ================================================
        ID = 3 (  2622):    72.11   2.806     1.83    19.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2623)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2610):   655.71  12.194     2.75    20.37
      + ID2= 2 (  2622):    72.11   2.806     1.83    19.78
        ================================================
        ID = 3 (  2623):   727.82  13.433     2.58    20.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679

     PEAK FLOW       (cms)=   0.301 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  19.215
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   1.360 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.214
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313
```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4630)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.893E+01	0.0	0.17	47.72
0.16	412.86	.357E+02	0.0	0.28	30.06
0.24	412.94	.804E+02	0.1	0.36	22.94
0.32	413.02	.143E+03	0.1	0.44	18.94
0.39	413.09	.223E+03	0.2	0.51	16.32
0.47	413.17	.322E+03	0.4	0.58	14.45
0.55	413.25	.438E+03	0.6	0.64	13.04
0.63	413.33	.572E+03	0.8	0.70	11.93
0.71	413.41	.724E+03	1.1	0.76	11.03
0.79	413.49	.893E+03	1.4	0.81	10.28
0.87	413.57	.108E+04	1.9	0.86	9.65
0.95	413.65	.129E+04	2.4	0.92	9.10
1.03	413.73	.151E+04	2.9	0.97	8.63
1.11	413.81	.175E+04	3.6	1.01	8.22
1.18	413.88	.201E+04	4.3	1.06	7.85
1.26	413.96	.229E+04	5.1	1.11	7.52
1.34	414.04	.258E+04	6.0	1.15	7.22
1.42	414.12	.289E+04	6.9	1.20	6.95
1.50	414.20	.323E+04	8.0	1.24	6.70

		<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0630)	33.04	1.36	1.83	19.21	0.77	0.80
OUTFLOW:	ID= 1 (4630)	33.04	1.25	2.00	19.21	0.75	0.78

ADD HYD (2637)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (2623):	727.82	13.433	2.58	20.31
	+ ID2= 2 (4630):	33.04	1.251	2.00	19.21
	ID = 3 (2637):	760.86	14.235	2.50	20.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2637)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (2637):	760.86	14.235	2.50	20.26
	+ ID2= 2 (0637):	8.36	0.301	2.00	19.22
	ID = 1 (2637):	769.22	14.442	2.50	20.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
NASHYD (0636)|	Area (ha)= 3.32	Curve Number (CN)= 70.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.48	

Unit Hyd Qpeak (cms)= 0.264

PEAK FLOW (cms)= 0.118 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 19.215
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2636)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (2637):	769.22	14.442	2.50	20.25
	+ ID2= 2 (0636):	3.32	0.118	2.00	19.22
	ID = 3 (2636):	772.54	14.524	2.50	20.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
NASHYD (0639)|	Area (ha)= 4.60	Curve Number (CN)= 70.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.43	

Unit Hyd Qpeak (cms)= 0.409

PEAK FLOW (cms)= 0.176 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 19.215
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
NASHYD (0638)|	Area (ha)= 20.63	Curve Number (CN)= 70.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.46	

Unit Hyd Qpeak (cms)= 1.713

PEAK FLOW (cms)= 0.753 (i)
TIME TO PEAK (hrs)= 1.917

```
     RUNOFF VOLUME    (mm)=  19.215
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   772.54  14.524     2.50    20.25
     + ID2= 2 (  0638):    20.63   0.753     1.92    19.22
       ================================================
       ID = 3 (  2630):   793.17  15.027     2.50    20.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   793.17  15.027     2.50    20.22
     + ID2= 2 (  0639):     4.60   0.176     1.92    19.21
       ================================================
       ID = 1 (  2630):   797.77  15.134     2.50    20.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH
```

```
--------------------------------------------------------------------------------------------------
--------------------
  ***********************************************
  ** SIMULATION : 25 year Fergus Shand Dam Chic **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=3023.000
| Ptotal= 74.68 mm |                          B=  18.000
--------------------                          C=   0.916
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  4.00 hrs
                         Storm time step    =  5.00 min
                         Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.03 |  1.00   25.41 |  2.00   13.91 |  3.00    4.68
                0.08    3.31 |  1.08   41.74 |  2.08   12.18 |  3.08    4.41
                0.17    3.65 |  1.17   86.90 |  2.17   10.79 |  3.17    4.17
                0.25    4.05 |  1.25  170.99 |  2.25    9.65 |  3.25    3.95
                0.33    4.54 |  1.33  106.07 |  2.33    8.70 |  3.33    3.75
                0.42    5.15 |  1.42   67.82 |  2.42    7.91 |  3.42    3.56
                0.50    5.92 |  1.50   47.76 |  2.50    7.23 |  3.50    3.40
                0.58    6.93 |  1.58   35.82 |  2.58    6.65 |  3.58    3.24
                0.67    8.29 |  1.67   28.10 |  2.67    6.15 |  3.67    3.10
                0.75   10.20 |  1.75   22.79 |  2.75    5.71 |  3.75    2.97
                0.83   13.02 |  1.83   18.97 |  2.83    5.33 |  3.83    2.85
                0.92   17.51 |  1.92   16.11 |  2.92    4.99 |  3.92    2.74

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   3.656 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  26.414
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.354

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.567 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  32.968
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.441

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                                    IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=           3.69          4.51
     Dep. Storage     (mm)=           2.00          5.00
     Average Slope     (%)=           1.20          1.20
     Length            (m)=          25.00         25.00
     Mannings n           =          0.013         0.250

     Max.Eff.Inten.(mm/hr)=         170.99         86.41
               over (min)             5.00         10.00
     Storage Coeff.  (min)=           0.85 (ii)     7.43 (ii)
     Unit Hyd. Tpeak (min)=           5.00         10.00
     Unit Hyd. peak  (cms)=           0.34          0.13
                                                              *TOTALS*
     PEAK FLOW       (cms)=           0.97          0.80        1.394 (iii)
     TIME TO PEAK    (hrs)=           1.33          1.50         1.33
     RUNOFF VOLUME    (mm)=          72.68         34.28        43.88
     TOTAL RAINFALL   (mm)=          74.68         74.68        74.68
     RUNOFF COEFFICIENT   =           0.97          0.46         0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
```

```
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.567     2.58    32.97
     + ID2= 2 (  0203):     8.20   1.394     1.33    43.88
       ================================================
       ID = 3 (  2200):    22.80   1.419     1.33    36.89

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.1980      0.2314
                          0.0040      0.0218  |    0.2920      0.2621
                          0.0060      0.0446  |    0.3980      0.2937
                          0.0070      0.0683  |    0.5150      0.3261
                          0.0080      0.0930  |    0.8290      0.3592
                          0.0090      0.1187  |    1.3520      0.3930
                          0.0230      0.1453  |    2.0570      0.4275
                          0.0610      0.1730  |    2.9590      0.4629
                          0.1200      0.2017  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.419      1.33      36.89
   OUTFLOW: ID= 1 (  5200)     22.800      0.653      2.83      36.83

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 46.01
                  TIME SHIFT OF PEAK FLOW        (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3407

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.568 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  52.802
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.707

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.85 (ii)    7.43 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.034 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28         43.85
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.97         0.46          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.568     1.83    52.80
     + ID2= 2 (  0206):     0.20   0.034     1.33    43.85
       ================================================
       ID = 3 (  2201):     5.00   0.581     1.83    52.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.581     1.83    52.44
     + ID2= 2 (  5200):    22.80   0.653     2.83    36.83
       ================================================
       ID = 1 (  2201):    27.80   0.888     2.00    39.64

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
```

```
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        58.93
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.04 (ii)   10.42 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.24          0.268 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.58
     RUNOFF VOLUME    (mm)=      72.68        29.82          33.25
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.40           0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.85 (ii)    7.43 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.13          0.221 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
```

```
--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.221     1.33    43.88
     + ID2= 2 (  0209):     2.70   0.268     1.58    33.25
       ==================================================
       ID = 3 (  2202):     4.00   0.452     1.50    36.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.452     1.50    36.70
     + ID2= 2 (  2201):    27.80   0.888     2.00    39.64
       ==================================================
       ID = 1 (  2202):    31.80   1.104     1.83    39.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   3.656     2.83    26.41
     + ID2= 2 (  2202):    31.80   1.104     1.83    39.27
       ==================================================
       ID = 3 (  2100):   168.78   4.532     2.75    28.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.192 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  32.965
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.441

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250
```

```
     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    7.85 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.52         0.42          0.741 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.192     1.92    32.97
     + ID2= 2 (  0304):     4.40   0.741     1.33    43.88
       ================================================
       ID = 3 (  2300):     7.30   0.780     1.42    39.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    7.85 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.034 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.86
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        58.93
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.85 (ii)    8.52 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.56          0.645 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.68        29.82          33.25
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.40           0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.780     1.42    39.54
     + ID2= 2 (  0308):     0.20   0.034     1.33    43.86
       ================================================
       ID = 3 (  2301):     7.50   0.813     1.42    39.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.813     1.42    39.66
     + ID2= 2 (  0310):     5.70   0.645     1.50    33.25
       ================================================
       ID = 1 (  2301):    13.20   1.452     1.42    36.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   4.532     2.75    28.84
     + ID2= 2 (  2301):    13.20   1.452     1.42    36.89
       ================================================
       ID = 3 (  2302):   181.98   4.761     2.75    29.42

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      8.29        74.57
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      0.70         2.00
     Length            (m)=   1437.00        40.00
     Mannings n          =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    121.32        55.40
               over (min)      15.00        25.00
     Storage Coeff.  (min)=    13.02 (ii)   21.96 (ii)
     Unit Hyd. Tpeak (min)=    15.00        25.00
     Unit Hyd. peak  (cms)=     0.08         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.60         5.12       5.557 (iii)
     TIME TO PEAK    (hrs)=     1.50         1.83        1.75
     RUNOFF VOLUME    (mm)=    72.68        28.68       30.00
     TOTAL RAINFALL   (mm)=    74.68        74.68       74.68
     RUNOFF COEFFICIENT   =     0.97         0.38        0.40

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   4.761     2.75    29.42
     + ID2= 2 (  0400):    82.86   5.557     1.75    30.00
       ================================================
       ID = 3 (  2400):   264.84   8.919     1.83    29.60

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                0.00        411.10        0.0550
               27.30        410.20        0.0550
               77.50        409.10        0.0550
               96.60        409.10        0.0550
              115.80        408.90        0.0550
              124.80        409.10        0.0550
              131.00        408.90    0.0550 /0.0350  Main Channel
              133.60        408.00        0.0350      Main Channel
              134.40        407.60        0.0350      Main Channel
              135.00        407.50        0.0350      Main Channel
              135.80        407.60        0.0350      Main Channel
              136.50        408.00        0.0350      Main Channel
              139.40        408.80    0.0350 /0.0550  Main Channel
              143.50        408.90        0.0550
              148.50        408.70        0.0550
              163.80        408.90        0.0550
              183.20        408.90        0.0550
              243.70        409.70        0.0550
              278.70        410.20        0.0550
              330.50        411.40        0.0550

     <---------- TRAVEL TIME TABLE ---------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)       (m/s)      (min)
      0.19   407.69    .366E+03       0.1         0.51       58.83
      0.37   407.87    .106E+04       0.5         0.81       37.08
      0.56   408.06    .199E+04       1.1         1.00       29.93
      0.74   408.24    .328E+04       2.1         1.14       26.32
      0.93   408.43    .498E+04       3.6         1.28       23.32
      1.11   408.61    .708E+04       5.6         1.43       20.94
      1.30   408.80    .105E+05       8.5         1.45       20.61
      1.49   408.99    .247E+05      14.8         1.07       27.91
      1.68   409.18    .601E+05      30.4         0.91       32.97
      1.87   409.37    .109E+06      58.5         0.96       31.05
      2.06   409.56    .166E+06      98.3         1.06       28.11
      2.25   409.75    .231E+06     150.3         1.17       25.57
      2.44   409.94    .303E+06     215.4         1.28       23.46
      2.64   410.14    .383E+06     293.8         1.38       21.74
      2.83   410.33    .470E+06     390.1         1.49       20.10
      3.02   410.52    .563E+06     502.4         1.60       18.66
      3.21   410.71    .660E+06     628.8         1.71       17.48
      3.40   410.90    .762E+06     769.5         1.81       16.49
      3.59   411.09    .868E+06     924.9         1.91       15.65

                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84     8.92    1.83  29.60      1.31      1.42
   OUTFLOW: ID= 1 (  4400)  264.84     7.72    2.33  29.60      1.25      1.45

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  90.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.70

     Unit Hyd Qpeak  (cms)=   2.039

     PEAK FLOW       (cms)=   1.929 (i)
     TIME TO PEAK    (hrs)=   3.500
```

```
     RUNOFF VOLUME    (mm)=  27.994
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.375

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70    0.0350 /0.0350  Main Channel
                   8.20         414.20        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350        in Channel
                  -0.00           0.00        0.0350            hannel
                  -0.00           0.00        0.0350               el
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                  -0.00           0.00        0.0350
                   0.00           0.00        0.0350
                   1.00           1.00        0.0350
                4510.00           2.00        0.0000

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN
      -Inf      -Inf    .000E+00       0.0           NaN        NaN

     **** WARNING:  INFLOW HYDROGRAPH IS DRY!!

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0511)|   Area    (ha)=  54.65   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.52

     Unit Hyd Qpeak  (cms)=   4.014

     PEAK FLOW       (cms)=   2.750 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  27.992
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.375

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0516)|   Area    (ha)=  11.47   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.56

     Unit Hyd Qpeak  (cms)=   0.782

     PEAK FLOW       (cms)=   0.550 (i)
     TIME TO PEAK    (hrs)=   2.083
     RUNOFF VOLUME    (mm)=  27.993
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.375

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4516)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
```

0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.125E+02	0.0	0.27	43.74
0.16	412.86	.500E+02	0.0	0.42	27.55
0.24	412.94	.113E+03	0.1	0.55	21.03
0.32	413.02	.200E+03	0.2	0.67	17.36
0.39	413.09	.313E+03	0.3	0.78	14.96
0.47	413.17	.450E+03	0.6	0.88	13.25
0.55	413.25	.613E+03	0.9	0.98	11.95
0.63	413.33	.801E+03	1.2	1.07	10.93
0.71	413.41	.101E+04	1.7	1.15	10.11
0.79	413.49	.125E+04	2.2	1.24	9.42
0.87	413.57	.151E+04	2.9	1.32	8.84
0.95	413.65	.180E+04	3.6	1.40	8.34
1.03	413.73	.211E+04	4.5	1.47	7.91
1.11	413.81	.245E+04	5.4	1.55	7.53
1.18	413.88	.281E+04	6.5	1.62	7.19
1.26	413.96	.320E+04	7.7	1.69	6.89
1.34	414.04	.362E+04	9.1	1.76	6.62
1.42	414.12	.405E+04	10.6	1.83	6.37
1.50	414.20	.452E+04	12.3	1.90	6.14

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0516)	11.47	0.55	2.08	27.99	0.47	0.87
OUTFLOW: ID= 1 (4516)	11.47	0.51	2.25	27.97	0.45	0.85

ADD HYD (2510)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (4516):	11.47	0.513	2.25	27.97
+ ID2= 2 (0511):	54.65	2.750	2.00	27.99
ID = 3 (2510):	66.12	3.214	2.08	27.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0517)	Area (ha)=	1.75	Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.32	

Unit Hyd Qpeak (cms)= 0.209

PEAK FLOW (cms)= 0.119 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 27.985
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.375

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2511)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2510):	66.12	3.214	2.08	27.99
+ ID2= 2 (4510):	90.75	1.929	3.50	27.99
ID = 3 (2511):	156.87	4.133	2.25	27.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2511)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2511):	156.87	4.133	2.25	27.99
+ ID2= 2 (0517):	1.75	0.119	1.75	27.98
ID = 1 (2511):	158.62	4.202	2.25	27.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0512)	Area (ha)=	31.10	Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.71	

Unit Hyd Qpeak (cms)= 1.673

PEAK FLOW (cms)= 1.269 (i)
TIME TO PEAK (hrs)= 2.250
RUNOFF VOLUME (mm)= 27.993
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.375

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0514)	Area (ha)=	2.65	Curve Number (CN)= 65.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.60	

Unit Hyd Qpeak (cms)= 0.169

PEAK FLOW (cms)= 0.101 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 23.515
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.315

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0515)	Area (ha)=	5.41	Curve Number (CN)= 65.0

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.504

     PEAK FLOW       (cms)=   0.262 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  23.513
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.315

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0513)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.579 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.940
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.374

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2511):   158.62   4.202     2.25    27.99
     + ID2= 2 (  0512):    31.10   1.269     2.25    27.99
       ================================================
       ID = 3 (  2512):   189.72   5.471     2.25    27.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   189.72   5.471     2.25    27.99
     + ID2= 2 (  0513):     6.68   0.579     1.58    27.94
       ================================================
       ID = 1 (  2512):   196.40   5.663     2.17    27.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   196.40   5.663     2.17    27.99
     + ID2= 2 (  0514):     2.65   0.101     2.17    23.51
       ================================================
       ID = 3 (  2512):   199.05   5.763     2.17    27.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   199.05   5.763     2.17    27.93
     + ID2= 2 (  0515):     5.41   0.262     1.92    23.51
       ================================================
       ID = 1 (  2512):   204.46   5.988     2.17    27.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   204.46   5.988     2.17    27.81
     + ID2= 2 (  4400):   264.84   7.720     2.33    29.60
       ================================================
       ID = 3 (  2513):   469.30  13.670     2.25    28.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   3.015 (i)
     TIME TO PEAK    (hrs)=   2.917
     RUNOFF VOLUME    (mm)=  27.993
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.375

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   469.30  13.670     2.25    28.82
     + ID2= 2 (  0520):   108.36   3.015     2.92    27.99
       ================================================
       ID = 3 (  2520):   577.66  16.134     2.33    28.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
```

0.00	409.70	0.0550	
19.70	408.80	0.0550	
41.70	407.20	0.0550	
60.50	405.30	0.0550	
80.00	404.50	0.0550	
95.70	404.60	0.0550 /0.0350	Main Channel
98.60	403.40	0.0350	Main Channel
100.40	403.40	0.0350	Main Channel
100.80	402.90	0.0350	Main Channel
101.50	402.70	0.0350	Main Channel
102.30	402.80	0.0350	Main Channel
103.30	403.20	0.0350	Main Channel
104.00	403.20	0.0350	Main Channel
105.60	404.40	0.0350 /0.0550	Main Channel
109.70	404.30	0.0550	
128.60	404.20	0.0550	
154.10	405.40	0.0550	
179.10	406.70	0.0550	
201.90	408.60	0.0550	
224.20	410.60	0.0550	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.34	403.04	.954E+03	0.3	0.70	47.40
0.68	403.38	.304E+04	1.6	1.03	32.27
1.02	403.72	.718E+04	4.5	1.25	26.57
1.36	404.06	.122E+05	9.7	1.58	20.96
1.70	404.40	.251E+05	18.1	1.44	23.04
2.08	404.78	.650E+05	42.3	1.29	25.62
2.46	405.16	.122E+06	86.3	1.40	23.62
2.84	405.54	.192E+06	151.6	1.57	21.10
3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85
4.35	407.05	.554E+06	631.1	2.26	14.63
4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

		<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (	2520)	577.66	16.13	2.33	28.67	1.62	1.47
OUTFLOW: ID= 1 (	4500)	577.66	14.84	2.83	28.67	1.57	1.49

CALIB					
NASHYD	(0610)	Area (ha)=	78.05	Curve Number (CN)=	71.0
ID= 1 DT= 5.0 min		Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	1.00		

Unit Hyd Qpeak (cms)= 2.981

PEAK FLOW (cms)= 2.489 (i)
TIME TO PEAK (hrs)= 2.667
RUNOFF VOLUME (mm)= 27.993
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.375

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2610)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (4500):	577.66	14.837	2.83	28.67
	+ ID2= 2 (0610):	78.05	2.489	2.67	27.99
	ID = 3 (2610):	655.71	17.274	2.83	28.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD	(0623)	Area (ha)=	19.37	Curve Number (CN)=	70.0
ID= 1 DT= 5.0 min		Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	0.45		

Unit Hyd Qpeak (cms)= 1.644

PEAK FLOW (cms)= 1.037 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 27.190
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.364

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD	(0625)	Area (ha)=	6.72	Curve Number (CN)=	70.0
ID= 1 DT= 5.0 min		Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	0.39		

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.393 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 27.188
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.364

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4625)			
IN= 2---> OUT= 1	Routing time step (min)'=	5.00	

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0360	Main Channel
4.30	412.70	0.0360	Main Channel
8.60	414.20	0.0360	Main Channel

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.108E+02	0.0	0.24	42.13
0.16	412.86	.434E+02	0.0	0.38	26.54
0.24	412.94	.976E+02	0.1	0.50	20.26
0.32	413.02	.174E+03	0.2	0.61	16.72
0.39	413.09	.271E+03	0.3	0.70	14.41
0.47	413.17	.390E+03	0.5	0.79	12.76
0.55	413.25	.532E+03	0.8	0.88	11.51
0.63	413.33	.694E+03	1.1	0.96	10.53
0.71	413.41	.879E+03	1.5	1.04	9.74
0.79	413.49	.108E+04	2.0	1.11	9.08
0.87	413.57	.131E+04	2.6	1.19	8.52
0.95	413.65	.156E+04	3.2	1.26	8.04
1.03	413.73	.183E+04	4.0	1.33	7.62
1.11	413.81	.213E+04	4.9	1.39	7.25
1.18	413.88	.244E+04	5.9	1.46	6.93
1.26	413.96	.278E+04	7.0	1.52	6.64
1.34	414.04	.313E+04	8.2	1.59	6.37
1.42	414.12	.351E+04	9.5	1.65	6.13
1.50	414.20	.392E+04	11.0	1.71	5.92

		<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0625)	6.72	0.39	1.83	27.19	0.43	0.74
OUTFLOW:	ID= 1 (4625)	6.72	0.35	2.08	27.15	0.41	0.72

CALIB					
NASHYD (0622)	ID= 1 DT= 5.0 min	Area (ha)= 9.69	Ia (mm)= 5.00	U.H. Tp(hrs)= 0.36	Curve Number (CN)= 70.0 # of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 1.028

PEAK FLOW (cms)= 0.594 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 27.187
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.364

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0621)	ID= 1 DT= 5.0 min	Area (ha)= 6.56	Ia (mm)= 5.00	U.H. Tp(hrs)= 0.37	Curve Number (CN)= 70.0 # of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.396 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 27.188
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.364

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0624)	ID= 1 DT= 5.0 min	Area (ha)= 11.84	Ia (mm)= 5.00	U.H. Tp(hrs)= 0.51	Curve Number (CN)= 70.0 # of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 0.887

PEAK FLOW (cms)= 0.585 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 27.191
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.364

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0626)	ID= 1 DT= 5.0 min	Area (ha)= 1.06	Total Imp(%)= 60.00	Dir. Conn.(%)= 50.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.64	0.42
Dep. Storage	(mm)=	1.00	10.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	84.06	40.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=	over (min)	170.99 5.00	64.62 15.00
Storage Coeff. (min)=		1.86 (ii)	10.26 (ii)
Unit Hyd. Tpeak (min)=		5.00	15.00
Unit Hyd. peak (cms)=		0.32	0.09

				TOTALS
PEAK FLOW	(cms)=	0.24	0.05	0.256 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.33
RUNOFF VOLUME	(mm)=	73.68	28.91	51.29
TOTAL RAINFALL	(mm)=	74.68	74.68	74.68
RUNOFF COEFFICIENT	=	0.99	0.39	0.69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 70.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2621)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (4625):	6.72	0.349	2.08	27.15
	+ ID2= 2 (0621):	6.56	0.396	1.83	27.19
	ID = 3 (2621):	13.28	0.715	1.92	27.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	13.28	0.715	1.92	27.17
+ ID2= 2 (0622):	9.69	0.594	1.83	27.19
ID = 1 (2621):	22.97	1.291	1.92	27.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2621):	22.97	1.291	1.92	27.18
+ ID2= 2 (0623):	19.37	1.037	1.92	27.19
ID = 3 (2621):	42.34	2.328	1.92	27.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	42.34	2.328	1.92	27.18
+ ID2= 2 (0624):	11.84	0.585	2.00	27.19
ID = 1 (2621):	54.18	2.902	1.92	27.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2621):	54.18	2.902	1.92	27.18
+ ID2= 2 (0626):	1.06	0.256	1.33	51.29
ID = 3 (2621):	55.24	2.960	1.92	27.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0627)| ID= 1 DT= 5.0 min	Area (ha)= 9.39	Curve Number (CN)= 70.0	
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.20		

Unit Hyd Qpeak (cms)= 1.793

PEAK FLOW (cms)= 0.788 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 27.140
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.363

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (6200)| ID= 1 DT= 5.0 min	Area (ha)= 6.66	Curve Number (CN)= 74.0	
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.28		

Unit Hyd Qpeak (cms)= 0.908

PEAK FLOW (cms)= 0.533 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 30.533
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.409

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (6201)| ID= 1 DT= 5.0 min	Area (ha)= 0.82	Curve Number (CN)= 74.0	
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.15		

Unit Hyd Qpeak (cms)= 0.209

PEAK FLOW (cms)= 0.089 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 30.372
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.407

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0113)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (6200):	6.66	0.533	1.67	30.53
+ ID2= 2 (6201):	0.82	0.089	1.50	30.37
ID = 3 (0113):	7.48	0.606	1.67	30.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4620)| IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)

0.08	412.78	.456E+01	0.0	0.55	7.70
0.16	412.86	.182E+02	0.1	0.88	4.85
0.24	412.94	.410E+02	0.2	1.15	3.70
0.32	413.02	.729E+02	0.4	1.39	3.05
0.39	413.09	.114E+03	0.7	1.61	2.63
0.47	413.17	.164E+03	1.2	1.82	2.33
0.55	413.25	.223E+03	1.8	2.02	2.10
0.63	413.33	.292E+03	2.5	2.21	1.92
0.71	413.41	.369E+03	3.5	2.39	1.78
0.79	413.49	.456E+03	4.6	2.56	1.66
0.87	413.57	.551E+03	5.9	2.73	1.56
0.95	413.65	.656E+03	7.4	2.89	1.47
1.03	413.73	.770E+03	9.2	3.05	1.39
1.11	413.81	.893E+03	11.2	3.21	1.32
1.18	413.88	.103E+04	13.5	3.36	1.27
1.26	413.96	.117E+04	16.0	3.51	1.21
1.34	414.04	.132E+04	18.9	3.65	1.16
1.42	414.12	.148E+04	22.0	3.79	1.12
1.50	414.20	.165E+04	25.4	3.93	1.08

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0113)	7.48	0.61	1.67	30.52	0.37	1.53
OUTFLOW: ID= 1 (4620)	7.48	0.60	1.67	30.51	0.36	1.52

ADD HYD (2620)|				
1 + 2 = 3 |	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (4620):	7.48	0.600	1.67	30.51
+ ID2= 2 (0627):	9.39	0.788	1.58	27.14
ID = 3 (2620):	16.87	1.354	1.67	28.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2622)|				
1 + 2 = 3 |	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2620):	16.87	1.354	1.67	28.64
+ ID2= 2 (2621):	55.24	2.960	1.92	27.65
ID = 3 (2622):	72.11	4.051	1.83	27.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2623)|				
1 + 2 = 3 |	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2610):	655.71	17.274	2.83	28.59
+ ID2= 2 (2622):	72.11	4.051	1.83	27.88
ID = 3 (2623):	727.82	18.903	2.67	28.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB |				
NASHYD (0637)|	Area	(ha)=	8.36	Curve Number (CN)= 70.0
ID= 1 DT= 5.0 min |	Ia	(mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=		0.47	

Unit Hyd Qpeak (cms)= 0.679

PEAK FLOW (cms)= 0.434 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 27.190
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.364

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB |				
NASHYD (0630)|	Area	(ha)=	33.04	Curve Number (CN)= 70.0
ID= 1 DT= 5.0 min |	Ia	(mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=		0.38	

Unit Hyd Qpeak (cms)= 3.321

PEAK FLOW (cms)= 1.963 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 27.188
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.364

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4630)|				
IN= 2---> OUT= 1 |	Routing time step (min)'= 5.00			

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.893E+01	0.0	0.17	47.72
0.16	412.86	.357E+02	0.0	0.28	30.06
0.24	412.94	.804E+02	0.1	0.36	22.94
0.32	413.02	.143E+03	0.1	0.44	18.94
0.39	413.09	.223E+03	0.2	0.51	16.32
0.47	413.17	.322E+03	0.4	0.58	14.45
0.55	413.25	.438E+03	0.6	0.64	13.04
0.63	413.33	.572E+03	0.8	0.70	11.93
0.71	413.41	.724E+03	1.1	0.76	11.03
0.79	413.49	.893E+03	1.4	0.81	10.28
0.87	413.57	.108E+04	1.9	0.86	9.65
0.95	413.65	.129E+04	2.4	0.92	9.10
1.03	413.73	.151E+04	2.9	0.97	8.63
1.11	413.81	.175E+04	3.6	1.01	8.22

```
      1.18   413.88    .201E+04       4.3          1.06       7.85
      1.26   413.96    .229E+04       5.1          1.11       7.52
      1.34   414.04    .258E+04       6.0          1.15       7.22
      1.42   414.12    .289E+04       6.9          1.20       6.95
      1.50   414.20    .323E+04       8.0          1.24       6.70

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
  INFLOW : ID= 2 (  0630)   33.04     1.96    1.83  27.19      0.88      0.87
  OUTFLOW: ID= 1 (  4630)   33.04     1.83    2.00  27.18      0.86      0.86



--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2623):   727.82  18.903     2.67    28.52
     + ID2= 2 (  4630):    33.04   1.829     2.00    27.18
       ================================================
       ID = 3 (  2637):   760.86  19.940     2.58    28.46

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   760.86  19.940     2.58    28.46
     + ID2= 2 (  0637):     8.36   0.434     2.00    27.19
       ================================================
       ID = 1 (  2637):   769.22  20.214     2.50    28.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.48

    Unit Hyd Qpeak  (cms)=   0.264

    PEAK FLOW       (cms)=   0.170 (i)
    TIME TO PEAK    (hrs)=   2.000
    RUNOFF VOLUME    (mm)=  27.190
    TOTAL RAINFALL   (mm)=  74.676
    RUNOFF COEFFICIENT   =   0.364

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   769.22  20.214     2.50    28.44
     + ID2= 2 (  0636):     3.32   0.170     2.00    27.19
       ================================================
       ID = 3 (  2636):   772.54  20.332     2.50    28.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.43

    Unit Hyd Qpeak  (cms)=   0.409

    PEAK FLOW       (cms)=   0.253 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=  27.190
    TOTAL RAINFALL   (mm)=  74.676
    RUNOFF COEFFICIENT   =   0.364

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.46

    Unit Hyd Qpeak  (cms)=   1.713

    PEAK FLOW       (cms)=   1.087 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=  27.190
    TOTAL RAINFALL   (mm)=  74.676
    RUNOFF COEFFICIENT   =   0.364

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   772.54  20.332     2.50    28.44
     + ID2= 2 (  0638):    20.63   1.087     1.92    27.19
       ================================================
       ID = 3 (  2630):   793.17  21.049     2.50    28.41

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   793.17  21.049     2.50    28.41
     + ID2= 2 (  0639):     4.60   0.253     1.92    27.19
       ================================================
       ID = 1 (  2630):   797.77  21.202     2.50    28.40

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
 FINISH
```

```
  **********************************************
  ** SIMULATION : 50 year Fergus Shand Dam Chic **
  **********************************************
```

```
| CHICAGO STORM    |    IDF curve parameters: A=3574.000
| Ptotal= 84.43 mm |                          B=  19.000
                     used in:   INTENSITY =  A / (t + B)^C
                     Duration of storm  =  4.00 hrs
                     Storm time step    =  5.00 min
                     Time to peak ratio =  0.33
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	3.36	1.00	29.13	2.00	15.89	3.00	5.24
0.08	3.68	1.08	47.79	2.08	13.89	3.08	4.93
0.17	4.06	1.17	98.38	2.17	12.28	3.17	4.65
0.25	4.51	1.25	189.90	2.25	10.96	3.25	4.40
0.33	5.08	1.33	119.63	2.33	9.87	3.33	4.17
0.42	5.77	1.42	77.23	2.42	8.95	3.42	3.96
0.50	6.66	1.50	54.63	2.50	8.18	3.50	3.77
0.58	7.83	1.58	41.06	2.58	7.51	3.58	3.60
0.67	9.40	1.67	32.23	2.67	6.93	3.67	3.44
0.75	11.60	1.75	26.13	2.75	6.42	3.75	3.29
0.83	14.86	1.83	21.72	2.83	5.98	3.83	3.15
0.92	20.04	1.92	18.43	2.92	5.59	3.92	3.03

```
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
                     U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   4.537 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  32.598
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.386

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
                     U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.690 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  39.944
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.473

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
                                  IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=           3.69          4.51
     Dep. Storage     (mm)=           2.00          5.00
     Average Slope     (%)=           1.20          1.20
     Length            (m)=          25.00         25.00
     Mannings n           =          0.013         0.250

     Max.Eff.Inten.(mm/hr)=         189.90        104.78
               over (min)             5.00         10.00
     Storage Coeff.  (min)=           0.81 (ii)     6.90 (ii)
     Unit Hyd. Tpeak (min)=           5.00         10.00
     Unit Hyd. peak  (cms)=           0.34          0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=           1.08          0.99          1.639 (iii)
     TIME TO PEAK    (hrs)=           1.33          1.50           1.42
     RUNOFF VOLUME    (mm)=          82.43         41.59          51.80
     TOTAL RAINFALL   (mm)=          84.43         84.43          84.43
     RUNOFF COEFFICIENT   =           0.98          0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| ADD HYD  (  2200)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
                             (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):     14.60   0.690     2.58    39.94
     + ID2= 2 (  0203):      8.20   1.639     1.42    51.80
       ================================================
       ID = 3 (  2200):     22.80   1.706     1.42    44.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                         (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1980      0.2314
                          0.0040      0.0218   |    0.2920      0.2621
                          0.0060      0.0446   |    0.3980      0.2937
                          0.0070      0.0683   |    0.5150      0.3261
                          0.0080      0.0930   |    0.8290      0.3592
                          0.0090      0.1187   |    1.3520      0.3930
                          0.0230      0.1453   |    2.0570      0.4275
```

```
                          0.0610      0.1730   |    2.9590      0.4629
                          0.1200      0.2017   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.706      1.42      44.21
   OUTFLOW: ID= 1 (  5200)     22.800      0.840      2.67      44.15

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 49.23
                    TIME SHIFT OF PEAK FLOW        (min)= 75.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.3599

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.668 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  61.867
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.733

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.81 (ii)    6.90 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.040 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.77
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.668     1.83    61.87
     + ID2= 2 (  0206):     0.20   0.040     1.42    51.77
       ================================================
       ID = 3 (  2201):     5.00   0.683     1.83    61.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.683     1.83    61.46
     + ID2= 2 (  5200):    22.80   0.840     2.67    44.15
       ================================================
       ID = 1 (  2201):    27.80   1.195     2.25    47.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        72.28
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.00 (ii)    9.64 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.31          0.358 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.43        36.53          40.20
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.43           0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
```

```
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.81 (ii)    6.90 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.16          0.260 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.80
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.260     1.42    51.80
     + ID2= 2 (  0209):     2.70   0.358     1.50    40.20
       ================================================
       ID = 3 (  2202):     4.00   0.610     1.42    43.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.610     1.42    43.97
     + ID2= 2 (  2201):    27.80   1.195     2.25    47.26
       ================================================
       ID = 1 (  2202):    31.80   1.368     1.83    46.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   4.537     2.83    32.60
     + ID2= 2 (  2202):    31.80   1.368     1.83    46.85
       ================================================
       ID = 3 (  2100):   168.78   5.637     2.75    35.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.234 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  39.941
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.473

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.86 (ii)    7.29 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.58         0.53          0.867 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.80
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.234     1.92    39.94
     + ID2= 2 (  0304):     4.40   0.867     1.42    51.80
       ================================================
       ID = 3 (  2300):     7.30   0.941     1.42    47.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.09         0.11
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.86 (ii)    7.29 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.02          0.039 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=     82.43        41.59         51.78
     TOTAL RAINFALL   (mm)=     84.43        84.43         84.43
     RUNOFF COEFFICIENT   =      0.98         0.49          0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.91         4.79
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    189.90        72.28
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.81 (ii)    7.88 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.24         0.71          0.803 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.50
     RUNOFF VOLUME    (mm)=     82.43        36.53         40.20
     TOTAL RAINFALL   (mm)=     84.43        84.43         84.43
     RUNOFF COEFFICIENT   =      0.98         0.43          0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.941     1.42    47.09
     + ID2= 2 (  0308):     0.20   0.039     1.42    51.78
       ================================================
       ID = 3 (  2301):     7.50   0.980     1.42    47.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.980     1.42    47.21
     + ID2= 2 (  0310):     5.70   0.803     1.50    40.20
       ================================================
       ID = 1 (  2301):    13.20   1.782     1.42    44.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   5.637     2.75    35.28
     + ID2= 2 (  2301):    13.20   1.782     1.42    44.19
       ================================================
       ID = 3 (  2302):   181.98   5.927     2.67    35.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      8.29        74.57
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      0.70         2.00
     Length            (m)=   1437.00        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    154.76        68.11
               over (min)       10.00        25.00
     Storage Coeff.  (min)=     11.81 (ii)   20.04 (ii)
     Unit Hyd. Tpeak (min)=     10.00        25.00
     Unit Hyd. peak  (cms)=      0.10         0.05
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.71         6.64          7.075 (iii)
     TIME TO PEAK    (hrs)=      1.42         1.75          1.75
     RUNOFF VOLUME    (mm)=     82.43        35.21         36.63
```

```
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.42           0.43

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   5.927     2.67    35.93
     + ID2= 2 (  0400):    82.86   7.075     1.75    36.63
       ================================================
       ID = 3 (  2400):   264.84  11.170     1.83    36.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         411.10        0.0550
                  27.30         410.20        0.0550
                  77.50         409.10        0.0550
                  96.60         409.10        0.0550
                 115.80         408.90        0.0550
                 124.80         409.10        0.0550
                 131.00         408.90    0.0550 /0.0350  Main Channel
                 133.60         408.00        0.0350      Main Channel
                 134.40         407.60        0.0350      Main Channel
                 135.00         407.50        0.0350      Main Channel
                 135.80         407.60        0.0350      Main Channel
                 136.50         408.00        0.0350      Main Channel
                 139.40         408.80    0.0350 /0.0550  Main Channel
                 143.50         408.90        0.0550
                 148.50         408.70        0.0550
                 163.80         408.90        0.0550
                 183.20         408.90        0.0550
                 243.70         409.70        0.0550
                 278.70         410.20        0.0550
                 330.50         411.40        0.0550

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.19   407.69    .366E+03       0.1          0.51      58.83
       0.37   407.87    .106E+04       0.5          0.81      37.08
       0.56   408.06    .199E+04       1.1          1.00      29.93
       0.74   408.24    .328E+04       2.1          1.14      26.32
       0.93   408.43    .498E+04       3.6          1.28      23.32
       1.11   408.61    .708E+04       5.6          1.43      20.94
       1.30   408.80    .105E+05       8.5          1.45      20.61
       1.49   408.99    .247E+05      14.8          1.07      27.91
       1.68   409.18    .601E+05      30.4          0.91      32.97
       1.87   409.37    .109E+06      58.5          0.96      31.05
       2.06   409.56    .166E+06      98.3          1.06      28.11
       2.25   409.75    .231E+06     150.3          1.17      25.57
       2.44   409.94    .303E+06     215.4          1.28      23.46
       2.64   410.14    .383E+06     293.8          1.38      21.74
       2.83   410.33    .470E+06     390.1          1.49      20.10
       3.02   410.52    .563E+06     502.4          1.60      18.66
       3.21   410.71    .660E+06     628.8          1.71      17.48
       3.40   410.90    .762E+06     769.5          1.81      16.49
       3.59   411.09    .868E+06     924.9          1.91      15.65

                                  <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
     INFLOW : ID= 2 (  2400)  264.84    11.17    1.83  36.15      1.38      1.26
     OUTFLOW: ID= 1 (  4400)  264.84     9.54    2.42  36.15      1.33      1.37


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  90.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.70

     Unit Hyd Qpeak  (cms)=   2.039

     PEAK FLOW       (cms)=   2.382 (i)
     TIME TO PEAK    (hrs)=   3.500
     RUNOFF VOLUME    (mm)=  34.443
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70    0.0350 /0.0350  Main Channel
                   8.20         414.20        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
                  -0.00           0.00        0.0350      Main Channel
```

```
              -0.00          0.00        0.0350      Main Channel
              -0.00          0.00        0.0350      Main Channel
              -0.00          0.00        0.0350      Main Channel
              -0.00          0.00        0.0350        in Channel
              -0.00          0.00        0.0350            hannel
              -0.00          0.00        0.0350               el
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
              -0.00          0.00        0.0350
               0.00          0.00        0.0350
               1.00          1.00        0.0350
            4510.00          2.00        0.0000

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN
       -Inf     -Inf    .000E+00       0.0          NaN        NaN

     **** WARNING:  INFLOW HYDROGRAPH IS DRY!!

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0511)|   Area    (ha)=  54.65   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.52

     Unit Hyd Qpeak  (cms)=   4.014

     PEAK FLOW       (cms)=   3.411 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  34.442
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0516)|   Area    (ha)=  11.47   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.56

     Unit Hyd Qpeak  (cms)=   0.782

     PEAK FLOW       (cms)=   0.682 (i)
     TIME TO PEAK    (hrs)=   2.083
     RUNOFF VOLUME    (mm)=  34.442
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4516)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------

                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00        414.20        0.0350      Main Channel
                    4.30        412.70        0.0350      Main Channel
                    8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .125E+02       0.0          0.27       43.74
       0.16   412.86    .500E+02       0.0          0.42       27.55
       0.24   412.94    .113E+03       0.1          0.55       21.03
       0.32   413.02    .200E+03       0.2          0.67       17.36
       0.39   413.09    .313E+03       0.3          0.78       14.96
       0.47   413.17    .450E+03       0.6          0.88       13.25
       0.55   413.25    .613E+03       0.9          0.98       11.95
       0.63   413.33    .801E+03       1.2          1.07       10.93
       0.71   413.41    .101E+04       1.7          1.15       10.11
       0.79   413.49    .125E+04       2.2          1.24        9.42
       0.87   413.57    .151E+04       2.9          1.32        8.84
       0.95   413.65    .180E+04       3.6          1.40        8.34
       1.03   413.73    .211E+04       4.5          1.47        7.91
       1.11   413.81    .245E+04       5.4          1.55        7.53
       1.18   413.88    .281E+04       6.5          1.62        7.19
       1.26   413.96    .320E+04       7.7          1.69        6.89
       1.34   414.04    .362E+04       9.1          1.76        6.62
       1.42   414.12    .405E+04      10.6          1.83        6.37
       1.50   414.20    .452E+04      12.3          1.90        6.14

                                   <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0516)   11.47     0.68    2.08  34.44      0.51      0.92
  OUTFLOW: ID= 1 (  4516)   11.47     0.64    2.25  34.42      0.49      0.90
```

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4516):    11.47   0.641     2.25    34.42
     + ID2= 2 (  0511):    54.65   3.411     2.00    34.44
       ================================================
       ID = 3 (  2510):    66.12   3.993     2.08    34.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   1.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.147 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  34.432
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):    66.12   3.993     2.08    34.44
     + ID2= 2 (  4510):    90.75   2.382     3.50    34.44
       ================================================
       ID = 3 (  2511):   156.87   5.126     2.25    34.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2511):   156.87   5.126     2.25    34.44
     + ID2= 2 (  0517):     1.75   0.147     1.75    34.43
       ================================================
       ID = 1 (  2511):   158.62   5.211     2.17    34.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0512)|   Area    (ha)=  31.10   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.71

     Unit Hyd Qpeak  (cms)=   1.673

     PEAK FLOW       (cms)=   1.573 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=  34.443
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0514)|   Area    (ha)=   2.65   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.60

     Unit Hyd Qpeak  (cms)=   0.169

     PEAK FLOW       (cms)=   0.126 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  29.181
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.346

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.41   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.504

     PEAK FLOW       (cms)=   0.327 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  29.179
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.346

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0513)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.718 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  34.377
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.407

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2511):   158.62   5.211     2.17    34.44
     + ID2= 2 (  0512):    31.10   1.573     2.25    34.44
       ================================================
       ID = 3 (  2512):   189.72   6.783     2.25    34.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   189.72   6.783     2.25    34.44
     + ID2= 2 (  0513):     6.68   0.718     1.58    34.38
       ================================================
       ID = 1 (  2512):   196.40   7.027     2.17    34.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   196.40   7.027     2.17    34.44
     + ID2= 2 (  0514):     2.65   0.126     2.17    29.18
       ================================================
       ID = 3 (  2512):   199.05   7.153     2.17    34.37

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   199.05   7.153     2.17    34.37
     + ID2= 2 (  0515):     5.41   0.327     1.92    29.18
       ================================================
       ID = 1 (  2512):   204.46   7.433     2.17    34.23

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   204.46   7.433     2.17    34.23
     + ID2= 2 (  4400):   264.84   9.539     2.42    36.15
       ================================================
       ID = 3 (  2513):   469.30  16.815     2.25    35.31

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

    Unit Hyd Qpeak  (cms)=   3.449

    PEAK FLOW       (cms)=   3.730 (i)
    TIME TO PEAK    (hrs)=   2.833
    RUNOFF VOLUME    (mm)=  34.443
    TOTAL RAINFALL   (mm)=  84.430
    RUNOFF COEFFICIENT   =   0.408

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   469.30  16.815     2.25    35.31
     + ID2= 2 (  0520):   108.36   3.730     2.83    34.44
       ================================================
       ID = 3 (  2520):   577.66  19.970     2.42    35.15

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         409.70        0.0550
                 19.70         408.80        0.0550
                 41.70         407.20        0.0550
                 60.50         405.30        0.0550
                 80.00         404.50        0.0550
                 95.70         404.60    0.0550 /0.0350  Main Channel
                 98.60         403.40        0.0350      Main Channel
                100.40         403.40        0.0350      Main Channel
                100.80         402.90        0.0350      Main Channel
                101.50         402.70        0.0350      Main Channel
                102.30         402.80        0.0350      Main Channel
                103.30         403.20        0.0350      Main Channel
                104.00         403.20        0.0350      Main Channel
                105.60         404.40    0.0350 /0.0550  Main Channel
                109.70         404.30        0.0550
                128.60         404.20        0.0550
                154.10         405.40        0.0550
                179.10         406.70        0.0550
                201.90         408.60        0.0550
                224.20         410.60        0.0550

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.34   403.04    .954E+03       0.3          0.70      47.40
      0.68   403.38    .304E+04       1.6          1.03      32.27
      1.02   403.72    .718E+04       4.5          1.25      26.57
      1.36   404.06    .122E+05       9.7          1.58      20.96
      1.70   404.40    .251E+05      18.1          1.44      23.04
      2.08   404.78    .650E+05      42.3          1.29      25.62
      2.46   405.16    .122E+06      86.3          1.40      23.62
      2.84   405.54    .192E+06     151.6          1.57      21.10
```

3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85
4.35	407.05	.554E+06	631.1	2.26	14.63
4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2520)	577.66	19.97	2.42	35.15	1.73	1.43
OUTFLOW: ID= 1 (4500)	577.66	18.27	2.92	35.15	1.70	1.44

CALIB					
NASHYD (0610)	Area (ha)=	78.05	Curve Number (CN)=	71.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	1.00			

Unit Hyd Qpeak (cms)= 2.981

PEAK FLOW (cms)= 3.080 (i)
TIME TO PEAK (hrs)= 2.583
RUNOFF VOLUME (mm)= 34.443
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.408

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2610)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (4500):	577.66	18.275	2.92	35.15
+	ID2= 2 (0610):	78.05	3.080	2.58	34.44
	ID = 3 (2610):	655.71	21.260	2.83	35.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0623)	Area (ha)=	19.37	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.45			

Unit Hyd Qpeak (cms)= 1.644

PEAK FLOW (cms)= 1.288 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 33.506
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.397

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0625)	Area (ha)=	6.72	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.39			

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.488 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 33.503
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.397

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4625)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0360	Main Channel
4.30	412.70	0.0360	Main Channel
8.60	414.20	0.0360	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.108E+02	0.0	0.24	42.13
0.16	412.86	.434E+02	0.0	0.38	26.54
0.24	412.94	.976E+02	0.1	0.50	20.26
0.32	413.02	.174E+03	0.2	0.61	16.72
0.39	413.09	.271E+03	0.3	0.70	14.41
0.47	413.17	.390E+03	0.5	0.79	12.76
0.55	413.25	.532E+03	0.8	0.88	11.51
0.63	413.33	.694E+03	1.1	0.96	10.53
0.71	413.41	.879E+03	1.5	1.04	9.74
0.79	413.49	.108E+04	2.0	1.11	9.08
0.87	413.57	.131E+04	2.6	1.19	8.52
0.95	413.65	.156E+04	3.2	1.26	8.04
1.03	413.73	.183E+04	4.0	1.33	7.62
1.11	413.81	.213E+04	4.9	1.39	7.25
1.18	413.88	.244E+04	5.9	1.46	6.93
1.26	413.96	.278E+04	7.0	1.52	6.64
1.34	414.04	.313E+04	8.2	1.59	6.37
1.42	414.12	.351E+04	9.5	1.65	6.13
1.50	414.20	.392E+04	11.0	1.71	5.92

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0625)	6.72	0.49	1.83	33.50	0.46	0.78
OUTFLOW: ID= 1 (4625)	6.72	0.44	2.08	33.47	0.44	0.76

```
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.737 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.502
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.492 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.502
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.727 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  33.507
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.64         0.42
     Dep. Storage     (mm)=      1.00        10.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     84.06        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    189.90        80.43
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      1.78 (ii)    6.78 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.32         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.27         0.07          0.306 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=     83.43        35.72          59.57
     TOTAL RAINFALL   (mm)=     84.43        84.43          84.43
     RUNOFF COEFFICIENT   =      0.99         0.42           0.71

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.436     2.08    33.47
     + ID2= 2 (  0621):     6.56   0.492     1.83    33.50
       ================================================
       ID = 3 (  2621):    13.28   0.896     1.92    33.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    13.28   0.896     1.92    33.49
     + ID2= 2 (  0622):     9.69   0.737     1.83    33.50
       ================================================
       ID = 1 (  2621):    22.97   1.610     1.92    33.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    22.97   1.610     1.92    33.49
     + ID2= 2 (  0623):    19.37   1.288     1.92    33.51
       ================================================
       ID = 3 (  2621):    42.34   2.898     1.92    33.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    42.34   2.898     1.92    33.50
```

```
      + ID2= 2 (  0624):    11.84   0.727     2.00    33.51
        ================================================
        ID = 1 (  2621):    54.18   3.612     1.92    33.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2621):    54.18   3.612     1.92    33.50
      + ID2= 2 (  0626):     1.06   0.306     1.33    59.57
        ================================================
        ID = 3 (  2621):    55.24   3.673     1.92    34.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.978 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  33.444
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  6200)|   Area    (ha)=   6.66   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

     Unit Hyd Qpeak  (cms)=   0.908

     PEAK FLOW       (cms)=   0.659 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  37.386
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.443

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  6201)|   Area    (ha)=   0.82   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.110 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  37.188
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.440

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  6200):     6.66   0.659     1.67    37.39
      + ID2= 2 (  6201):     0.82   0.110     1.50    37.19
        ================================================
        ID = 3 (  0113):     7.48   0.747     1.67    37.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .456E+01       0.0          0.55       7.70
        0.16   412.86    .182E+02       0.1          0.88       4.85
        0.24   412.94    .410E+02       0.2          1.15       3.70
        0.32   413.02    .729E+02       0.4          1.39       3.05
        0.39   413.09    .114E+03       0.7          1.61       2.63
        0.47   413.17    .164E+03       1.2          1.82       2.33
        0.55   413.25    .223E+03       1.8          2.02       2.10
        0.63   413.33    .292E+03       2.5          2.21       1.92
        0.71   413.41    .369E+03       3.5          2.39       1.78
        0.79   413.49    .456E+03       4.6          2.56       1.66
        0.87   413.57    .551E+03       5.9          2.73       1.56
        0.95   413.65    .656E+03       7.4          2.89       1.47
        1.03   413.73    .770E+03       9.2          3.05       1.39
        1.11   413.81    .893E+03      11.2          3.21       1.32
        1.18   413.88    .103E+04      13.5          3.36       1.27
        1.26   413.96    .117E+04      16.0          3.51       1.21
        1.34   414.04    .132E+04      18.9          3.65       1.16
        1.42   414.12    .148E+04      22.0          3.79       1.12
        1.50   414.20    .165E+04      25.4          3.93       1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
     INFLOW : ID= 2 (  0113)     7.48     0.75    1.67   37.36      0.40      1.63
     OUTFLOW: ID= 1 (  4620)     7.48     0.74    1.67   37.36      0.40      1.62
```

```
--------------------
| ADD HYD  (  2620)|
```

```
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4620):     7.48   0.745     1.67    37.36
     + ID2= 2 (  0627):     9.39   0.978     1.58    33.44
       ================================================
       ID = 3 (  2620):    16.87   1.679     1.67    35.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):    16.87   1.679     1.67    35.18
     + ID2= 2 (  2621):    55.24   3.673     1.92    34.00
       ================================================
       ID = 3 (  2622):    72.11   5.023     1.83    34.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2623)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2610):   655.71  21.260     2.83    35.07
     + ID2= 2 (  2622):    72.11   5.023     1.83    34.28
       ================================================
       ID = 3 (  2623):   727.82  23.171     2.67    34.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679

     PEAK FLOW       (cms)=   0.539 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  33.506
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   2.438 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.503
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70        0.0350      Main Channel
                   8.60         414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV       VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)       (cms)        (m/s)      (min)
      0.08   412.78    .893E+01        0.0          0.17       47.72
      0.16   412.86    .357E+02        0.0          0.28       30.06
      0.24   412.94    .804E+02        0.1          0.36       22.94
      0.32   413.02    .143E+03        0.1          0.44       18.94
      0.39   413.09    .223E+03        0.2          0.51       16.32
      0.47   413.17    .322E+03        0.4          0.58       14.45
      0.55   413.25    .438E+03        0.6          0.64       13.04
      0.63   413.33    .572E+03        0.8          0.70       11.93
      0.71   413.41    .724E+03        1.1          0.76       11.03
      0.79   413.49    .893E+03        1.4          0.81       10.28
      0.87   413.57    .108E+04        1.9          0.86        9.65
      0.95   413.65    .129E+04        2.4          0.92        9.10
      1.03   413.73    .151E+04        2.9          0.97        8.63
      1.11   413.81    .175E+04        3.6          1.01        8.22
      1.18   413.88    .201E+04        4.3          1.06        7.85
      1.26   413.96    .229E+04        5.1          1.11        7.52
      1.34   414.04    .258E+04        6.0          1.15        7.22
      1.42   414.12    .289E+04        6.9          1.20        6.95
      1.50   414.20    .323E+04        8.0          1.24        6.70

                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0630)   33.04     2.44    1.83  33.50      0.96      0.92
  OUTFLOW: ID= 1 (  4630)   33.04     2.28    2.00  33.49      0.93      0.91

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2623):   727.82  23.171     2.67    34.99
     + ID2= 2 (  4630):    33.04   2.282     2.00    33.49
       ================================================
       ID = 3 (  2637):   760.86  24.391     2.58    34.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
```

```
       ID1= 3 (  2637):   760.86  24.391     2.58    34.92
     + ID2= 2 (  0637):     8.36   0.539     1.92    33.51
       ================================================
       ID = 1 (  2637):   769.22  24.719     2.58    34.91

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

    Unit Hyd Qpeak  (cms)=   0.264

    PEAK FLOW       (cms)=   0.212 (i)
    TIME TO PEAK    (hrs)=   2.000
    RUNOFF VOLUME    (mm)=  33.506
    TOTAL RAINFALL   (mm)=  84.430
    RUNOFF COEFFICIENT   =   0.397

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   769.22  24.719     2.58    34.91
     + ID2= 2 (  0636):     3.32   0.212     2.00    33.51
       ================================================
       ID = 3 (  2636):   772.54  24.852     2.58    34.90

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

    Unit Hyd Qpeak  (cms)=   0.409

    PEAK FLOW       (cms)=   0.315 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=  33.505
    TOTAL RAINFALL   (mm)=  84.430
    RUNOFF COEFFICIENT   =   0.397

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

    Unit Hyd Qpeak  (cms)=   1.713

    PEAK FLOW       (cms)=   1.351 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=  33.506
    TOTAL RAINFALL   (mm)=  84.430
    RUNOFF COEFFICIENT   =   0.397

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   772.54  24.852     2.58    34.90
     + ID2= 2 (  0638):    20.63   1.351     1.92    33.51
       ================================================
       ID = 3 (  2630):   793.17  25.716     2.50    34.86

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   793.17  25.716     2.50    34.86
     + ID2= 2 (  0639):     4.60   0.315     1.92    33.50
       ================================================
       ID = 1 (  2630):   797.77  25.904     2.50    34.86

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH

--------------------------------------------------------------------------------
--------------------
  ***********************************************
  ** SIMULATION : 100 year Fergus Shand Dam Chi **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=4382.000
| Ptotal= 94.08 mm |                          B=  21.000
--------------------                          C=   0.939
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

    TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
     hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
    0.00    3.55 |  1.00   33.31 |  2.00   18.02 |  3.00    5.69
    0.08    3.91 |  1.08   54.51 |  2.08   15.69 |  3.08    5.34
    0.17    4.34 |  1.17  109.99 |  2.17   13.83 |  3.17    5.02
    0.25    4.86 |  1.25  205.33 |  2.25   12.30 |  3.25    4.73
    0.33    5.50 |  1.33  132.84 |  2.33   11.04 |  3.33    4.47
    0.42    6.30 |  1.42   87.25 |  2.42    9.97 |  3.42    4.24
    0.50    7.33 |  1.50   62.23 |  2.50    9.07 |  3.50    4.02
    0.58    8.67 |  1.58   46.93 |  2.58    8.30 |  3.58    3.82
    0.67   10.48 |  1.67   36.86 |  2.67    7.63 |  3.67    3.64
    0.75   13.04 |  1.75   29.86 |  2.75    7.05 |  3.75    3.48
    0.83   16.82 |  1.83   24.77 |  2.83    6.54 |  3.83    3.32
    0.92   22.83 |  1.92   20.96 |  2.92    6.09 |  3.92    3.18
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   5.477 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  39.053
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.415

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.820 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  47.141
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.501

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.69         4.51
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    205.33       122.38
               over (min)        5.00        10.00
     Storage Coeff.  (min)=     0.79 (ii)    6.51 (ii)
     Unit Hyd. Tpeak (min)=     5.00        10.00
     Unit Hyd. peak  (cms)=     0.34         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=     1.17         1.18         1.912 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=    92.08        49.10         59.84
     TOTAL RAINFALL   (mm)=    94.08        94.08         94.08
     RUNOFF COEFFICIENT   =     0.98         0.52          0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN*  =  71.0    Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
   (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.820     2.58    47.14
     + ID2= 2 (  0203):     8.20   1.912     1.42    59.84
       ================================================
       ID = 3 (  2200):    22.80   1.993     1.42    51.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000  |    0.1980      0.2314
                           0.0040      0.0218  |    0.2920      0.2621
                           0.0060      0.0446  |    0.3980      0.2937
                           0.0070      0.0683  |    0.5150      0.3261
                           0.0080      0.0930  |    0.8290      0.3592
                           0.0090      0.1187  |    1.3520      0.3930
                           0.0230      0.1453  |    2.0570      0.4275
                           0.0610      0.1730  |    2.9590      0.4629
                           0.1200      0.2017  |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.993      1.42      51.71
   OUTFLOW: ID= 1 (  5200)     22.800      1.037      2.50      51.65

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 52.04
                  TIME SHIFT OF PEAK FLOW         (min)= 65.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3727

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.768 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  70.945
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.754

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

```
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       122.38
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.79 (ii)    6.51 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.047 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.82
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.768     1.83    70.94
     + ID2= 2 (  0206):     0.20   0.047     1.42    59.82
       ================================================
       ID = 3 (  2201):     5.00   0.785     1.83    70.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.785     1.83    70.50
     + ID2= 2 (  5200):    22.80   1.037     2.50    51.65
       ================================================
       ID = 1 (  2201):    27.80   1.567     2.17    55.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        85.24
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.97 (ii)    9.06 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.38          0.432 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=      92.08        43.49          47.38
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.46           0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       122.38
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.79 (ii)    6.51 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.19          0.303 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.84
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
```

```
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.303     1.42    59.84
     + ID2= 2 (  0209):     2.70   0.432     1.50    47.38
       ================================================
       ID = 3 (  2202):     4.00   0.725     1.42    51.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.725     1.42    51.43
     + ID2= 2 (  2201):    27.80   1.567     2.17    55.04
       ================================================
       ID = 1 (  2202):    31.80   1.765     2.08    54.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   5.477     2.83    39.05
     + ID2= 2 (  2202):    31.80   1.765     2.08    54.59
       ================================================
       ID = 3 (  2100):   168.78   6.786     2.67    41.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.277 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  47.137
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.501

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       122.38
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.83 (ii)    6.88 (ii)
     Unit Hyd. Tpeak (min)=        5.00        10.00
     Unit Hyd. peak  (cms)=        0.34         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=        0.63         0.63         1.012 (iii)
     TIME TO PEAK    (hrs)=        1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=       92.08        49.10         59.84
     TOTAL RAINFALL   (mm)=       94.08        94.08         94.08
     RUNOFF COEFFICIENT   =        0.98         0.52          0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.277     1.92    47.14
     + ID2= 2 (  0304):     4.40   1.012     1.42    59.84
       ================================================
       ID = 3 (  2300):     7.30   1.100     1.42    54.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       122.38
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.83 (ii)    6.88 (ii)
     Unit Hyd. Tpeak (min)=        5.00        10.00
     Unit Hyd. peak  (cms)=        0.34         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=        0.03         0.03         0.046 (iii)
     TIME TO PEAK    (hrs)=        1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=       92.08        49.10         59.82
     TOTAL RAINFALL   (mm)=       94.08        94.08         94.08
     RUNOFF COEFFICIENT   =        0.98         0.52          0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        85.24
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.79 (ii)    7.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.85          0.965 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      92.08        43.49         47.38
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.98         0.46          0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   1.100     1.42    54.80
     + ID2= 2 (  0308):     0.20   0.046     1.42    59.82
       ================================================
       ID = 3 (  2301):     7.50   1.146     1.42    54.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   1.146     1.42    54.93
     + ID2= 2 (  0310):     5.70   0.965     1.42    47.38
       ================================================
       ID = 1 (  2301):    13.20   2.111     1.42    51.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   6.786     2.67    41.98
     + ID2= 2 (  2301):    13.20   2.111     1.42    51.67
       ================================================
       ID = 3 (  2302):   181.98   7.131     2.67    42.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     169.08        80.49
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      11.40 (ii)   19.10 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.10         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.80         8.26          8.850 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.67          1.67
     RUNOFF VOLUME    (mm)=      92.08        42.01         43.51
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.98         0.45          0.46

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   7.131     2.67    42.68
     + ID2= 2 (  0400):    82.86   8.850     1.67    43.51
       ================================================
       ID = 3 (  2400):   264.84  13.550     1.75    42.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                 0.00         411.10        0.0550
```

27.30	410.20	0.0550		
77.50	409.10	0.0550		
96.60	409.10	0.0550		
115.80	408.90	0.0550		
124.80	409.10	0.0550		
131.00	408.90	0.0550 /0.0350	Main Channel	
133.60	408.00	0.0350	Main Channel	
134.40	407.60	0.0350	Main Channel	
135.00	407.50	0.0350	Main Channel	
135.80	407.60	0.0350	Main Channel	
136.50	408.00	0.0350	Main Channel	
139.40	408.80	0.0350 /0.0550	Main Channel	
143.50	408.90	0.0550		
148.50	408.70	0.0550		
163.80	408.90	0.0550		
183.20	408.90	0.0550		
243.70	409.70	0.0550		
278.70	410.20	0.0550		
330.50	411.40	0.0550		

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.19	407.69	.366E+03	0.1	0.51	58.83
0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66
3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

		<---- hydrograph ---->				<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2	(2400)	264.84	13.55	1.75	42.94	1.45	1.13
OUTFLOW: ID= 1	(4400)	264.84	11.20	2.42	42.94	1.38	1.26

CALIB					
NASHYD	(0510)	Area (ha)=	90.75	Curve Number (CN)=	71.0
ID= 1 DT= 5.0 min		Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	1.70		

Unit Hyd Qpeak (cms)= 2.039

PEAK FLOW (cms)= 2.861 (i)
TIME TO PEAK (hrs)= 3.417
RUNOFF VOLUME (mm)= 41.154

TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.437

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4510)		
IN= 2---> OUT= 1	Routing time step (min)'=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350 /0.0350	Main Channel
8.20	414.20	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	in Channel
-0.00	0.00	0.0350	hannel
-0.00	0.00	0.0350	el
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
-0.00	0.00	0.0350	
0.00	0.00	0.0350	
1.00	1.00	0.0350	
4510.00	2.00	0.0000	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN

```
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN
       -Inf     -Inf    .000E+00       0.0           NaN        NaN

     **** WARNING:  INFLOW HYDROGRAPH IS DRY!!

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0511)|   Area    (ha)=  54.65   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.52

     Unit Hyd Qpeak  (cms)=   4.014

     PEAK FLOW       (cms)=   4.110 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  41.152
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0516)|   Area    (ha)=  11.47   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.56

     Unit Hyd Qpeak  (cms)=   0.782

     PEAK FLOW       (cms)=   0.822 (i)
     TIME TO PEAK    (hrs)=   2.083
     RUNOFF VOLUME    (mm)=  41.152
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4516)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

          <--------------------- TRAVEL TIME TABLE ---------------------->
           DEPTH     ELEV      VOLUME    FLOW RATE     VELOCITY   TRAV.TIME
            (m)       (m)     (cu.m.)      (cms)         (m/s)      (min)
           0.08    412.78    .125E+02       0.0          0.27       43.74
           0.16    412.86    .500E+02       0.0          0.42       27.55
           0.24    412.94    .113E+03       0.1          0.55       21.03
           0.32    413.02    .200E+03       0.2          0.67       17.36
           0.39    413.09    .313E+03       0.3          0.78       14.96
           0.47    413.17    .450E+03       0.6          0.88       13.25
           0.55    413.25    .613E+03       0.9          0.98       11.95
           0.63    413.33    .801E+03       1.2          1.07       10.93
           0.71    413.41    .101E+04       1.7          1.15       10.11
           0.79    413.49    .125E+04       2.2          1.24        9.42
           0.87    413.57    .151E+04       2.9          1.32        8.84
           0.95    413.65    .180E+04       3.6          1.40        8.34
           1.03    413.73    .211E+04       4.5          1.47        7.91
           1.11    413.81    .245E+04       5.4          1.55        7.53
           1.18    413.88    .281E+04       6.5          1.62        7.19
           1.26    413.96    .320E+04       7.7          1.69        6.89
           1.34    414.04    .362E+04       9.1          1.76        6.62
           1.42    414.12    .405E+04      10.6          1.83        6.37
           1.50    414.20    .452E+04      12.3          1.90        6.14

                                    <---- hydrograph ---->   <-pipe / channel->
                                      AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                      (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
     INFLOW : ID= 2 (  0516)   11.47     0.82    2.08  41.15      0.54      0.96
     OUTFLOW: ID= 1 (  4516)   11.47     0.78    2.25  41.13      0.53      0.95

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4516):    11.47   0.777     2.25    41.13
     + ID2= 2 (  0511):    54.65   4.110     2.00    41.15
       ================================================
       ID = 3 (  2510):    66.12   4.820     2.08    41.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   1.75   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.177 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  41.141
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):    66.12   4.820     2.08    41.15
     + ID2= 2 (  4510):    90.75   2.861     3.42    41.15
       ================================================
       ID = 3 (  2511):   156.87   6.184     2.25    41.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2511)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2511):   156.87   6.184     2.25    41.15
     + ID2= 2 (  0517):     1.75   0.177     1.75    41.14
       ================================================
       ID = 1 (  2511):   158.62   6.291     2.17    41.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0512)|   Area    (ha)=  31.10   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.71

     Unit Hyd Qpeak  (cms)=   1.673

     PEAK FLOW       (cms)=   1.896 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=  41.153
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0514)|   Area    (ha)=   2.65   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.60

     Unit Hyd Qpeak  (cms)=   0.169

     PEAK FLOW       (cms)=   0.153 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  35.135
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.373

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.41   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.504

     PEAK FLOW       (cms)=   0.397 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  35.132
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.373

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0513)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.861 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  41.075
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2511):   158.62   6.291     2.17    41.15
     + ID2= 2 (  0512):    31.10   1.896     2.25    41.15
       ================================================
       ID = 3 (  2512):   189.72   8.182     2.25    41.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2512)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2512):   189.72   8.182     2.25    41.15
     + ID2= 2 (  0513):     6.68   0.861     1.58    41.08
       ================================================
       ID = 1 (  2512):   196.40   8.479     2.17    41.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2512):   196.40   8.479     2.17    41.15
     + ID2= 2 (  0514):     2.65   0.153     2.17    35.13
       ================================================
       ID = 3 (  2512):   199.05   8.632     2.17    41.07
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2512)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (2512):	199.05	8.632	2.17	41.07
	+ ID2= 2 (0515):	5.41	0.397	1.92	35.13
	ID = 1 (2512):	204.46	8.972	2.17	40.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2513)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2512):	204.46	8.972	2.17	40.91
	+ ID2= 2 (4400):	264.84	11.197	2.42	42.94
	ID = 3 (2513):	469.30	19.977	2.25	42.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0520)	Area	(ha)= 108.36	Curve Number	(CN)= 71.0	
ID= 1 DT= 5.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 1.20				

Unit Hyd Qpeak (cms)= 3.449

PEAK FLOW (cms)= 4.491 (i)
TIME TO PEAK (hrs)= 2.833
RUNOFF VOLUME (mm)= 41.154
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.437

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2520)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2513):	469.30	19.977	2.25	42.06
	+ ID2= 2 (0520):	108.36	4.491	2.83	41.15
	ID = 3 (2520):	577.66	23.768	2.42	41.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4500)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	409.70	0.0550	
19.70	408.80	0.0550	
41.70	407.20	0.0550	
60.50	405.30	0.0550	
80.00	404.50	0.0550	
95.70	404.60	0.0550 /0.0350	Main Channel
98.60	403.40	0.0350	Main Channel
100.40	403.40	0.0350	Main Channel
100.80	402.90	0.0350	Main Channel
101.50	402.70	0.0350	Main Channel
102.30	402.80	0.0350	Main Channel
103.30	403.20	0.0350	Main Channel
104.00	403.20	0.0350	Main Channel
105.60	404.40	0.0350 /0.0550	Main Channel
109.70	404.30	0.0550	
128.60	404.20	0.0550	
154.10	405.40	0.0550	
179.10	406.70	0.0550	
201.90	408.60	0.0550	
224.20	410.60	0.0550	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.34	403.04	.954E+03	0.3	0.70	47.40
0.68	403.38	.304E+04	1.6	1.03	32.27
1.02	403.72	.718E+04	4.5	1.25	26.57
1.36	404.06	.122E+05	9.7	1.58	20.96
1.70	404.40	.251E+05	18.1	1.44	23.04
2.08	404.78	.650E+05	42.3	1.29	25.62
2.46	405.16	.122E+06	86.3	1.40	23.62
2.84	405.54	.192E+06	151.6	1.57	21.10
3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85
4.35	407.05	.554E+06	631.1	2.26	14.63
4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2520)		577.66	23.77	2.42	41.89	1.79	1.40
OUTFLOW: ID= 1 (4500)		577.66	21.82	2.92	41.89	1.75	1.41

CALIB					
NASHYD (0610)	Area	(ha)= 78.05	Curve Number	(CN)= 71.0	
ID= 1 DT= 5.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 1.00				

Unit Hyd Qpeak (cms)= 2.981

PEAK FLOW (cms)= 3.712 (i)
TIME TO PEAK (hrs)= 2.583
RUNOFF VOLUME (mm)= 41.153

```
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  4500):   577.66  21.821     2.92    41.89
      + ID2= 2 (  0610):    78.05   3.712     2.58    41.15
        ================================================
        ID = 3 (  2610):   655.71  25.393     2.83    41.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   1.554 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  40.088
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.588 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.085
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0360      Main Channel
                   4.30        412.70        0.0360      Main Channel
                   8.60        414.20        0.0360      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->

     DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
      (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
     0.08   412.78    .108E+02       0.0          0.24      42.13
     0.16   412.86    .434E+02       0.0          0.38      26.54
     0.24   412.94    .976E+02       0.1          0.50      20.26
     0.32   413.02    .174E+03       0.2          0.61      16.72
     0.39   413.09    .271E+03       0.3          0.70      14.41
     0.47   413.17    .390E+03       0.5          0.79      12.76
     0.55   413.25    .532E+03       0.8          0.88      11.51
     0.63   413.33    .694E+03       1.1          0.96      10.53
     0.71   413.41    .879E+03       1.5          1.04       9.74
     0.79   413.49    .108E+04       2.0          1.11       9.08
     0.87   413.57    .131E+04       2.6          1.19       8.52
     0.95   413.65    .156E+04       3.2          1.26       8.04
     1.03   413.73    .183E+04       4.0          1.33       7.62
     1.11   413.81    .213E+04       4.9          1.39       7.25
     1.18   413.88    .244E+04       5.9          1.46       6.93
     1.26   413.96    .278E+04       7.0          1.52       6.64
     1.34   414.04    .313E+04       8.2          1.59       6.37
     1.42   414.12    .351E+04       9.5          1.65       6.13
     1.50   414.20    .392E+04      11.0          1.71       5.92

                                <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0625)    6.72     0.59    1.83   40.09      0.50      0.82
   OUTFLOW: ID= 1 (  4625)    6.72     0.53    2.00   40.05      0.48      0.80

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.888 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.083
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.593 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.084
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.877 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  40.089
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.64         0.42
     Dep. Storage     (mm)=       1.00        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      84.06        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        95.83
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.73 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.09          0.338 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      93.08        42.79          67.93
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.99         0.45           0.72

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  4625):     6.72   0.532     2.00    40.05
      + ID2= 2 (  0621):     6.56   0.593     1.83    40.08
        ================================================
        ID = 3 (  2621):    13.28   1.089     1.92    40.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2621):    13.28   1.089     1.92    40.07
      + ID2= 2 (  0622):     9.69   0.888     1.83    40.08
        ================================================
        ID = 1 (  2621):    22.97   1.949     1.92    40.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2621):    22.97   1.949     1.92    40.07
      + ID2= 2 (  0623):    19.37   1.554     1.92    40.09
        ================================================
        ID = 3 (  2621):    42.34   3.503     1.92    40.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2621):    42.34   3.503     1.92    40.08
      + ID2= 2 (  0624):    11.84   0.877     2.00    40.09
        ================================================
        ID = 1 (  2621):    54.18   4.365     1.92    40.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2621):    54.18   4.365     1.92    40.08
      + ID2= 2 (  0626):     1.06   0.338     1.33    67.93
        ================================================
        ID = 3 (  2621):    55.24   4.436     1.92    40.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   1.174 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  40.015
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.425
```

```
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  6200)|   Area    (ha)=   6.66   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28

     Unit Hyd Qpeak  (cms)=   0.908

     PEAK FLOW       (cms)=   0.788 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  44.478
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.473

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  6201)|   Area    (ha)=   0.82   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.15

     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.131 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  44.243
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.470

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6200):     6.66   0.788     1.67    44.48
     + ID2= 2 (  6201):     0.82   0.131     1.50    44.24
       ================================================
       ID = 3 (  0113):     7.48   0.894     1.67    44.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .456E+01       0.0          0.55       7.70
        0.16   412.86    .182E+02       0.1          0.88       4.85
        0.24   412.94    .410E+02       0.2          1.15       3.70
        0.32   413.02    .729E+02       0.4          1.39       3.05
        0.39   413.09    .114E+03       0.7          1.61       2.63
        0.47   413.17    .164E+03       1.2          1.82       2.33
        0.55   413.25    .223E+03       1.8          2.02       2.10
        0.63   413.33    .292E+03       2.5          2.21       1.92
        0.71   413.41    .369E+03       3.5          2.39       1.78
        0.79   413.49    .456E+03       4.6          2.56       1.66
        0.87   413.57    .551E+03       5.9          2.73       1.56
        0.95   413.65    .656E+03       7.4          2.89       1.47
        1.03   413.73    .770E+03       9.2          3.05       1.39
        1.11   413.81    .893E+03      11.2          3.21       1.32
        1.18   413.88    .103E+04      13.5          3.36       1.27
        1.26   413.96    .117E+04      16.0          3.51       1.21
        1.34   414.04    .132E+04      18.9          3.65       1.16
        1.42   414.12    .148E+04      22.0          3.79       1.12
        1.50   414.20    .165E+04      25.4          3.93       1.08

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0113)    7.48     0.89    1.67   44.45      0.42      1.69
   OUTFLOW: ID= 1 (  4620)    7.48     0.89    1.67   44.45      0.42      1.69


--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4620):     7.48   0.888     1.67    44.45
     + ID2= 2 (  0627):     9.39   1.174     1.58    40.01
       ================================================
       ID = 3 (  2620):    16.87   2.011     1.67    41.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):    16.87   2.011     1.67    41.98
     + ID2= 2 (  2621):    55.24   4.436     1.92    40.62
       ================================================
       ID = 3 (  2622):    72.11   6.058     1.83    40.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2623)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2610):   655.71  25.393     2.83    41.80
     + ID2= 2 (  2622):    72.11   6.058     1.83    40.94
       ================================================
       ID = 3 (  2623):   727.82  27.644     2.67    41.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679

     PEAK FLOW       (cms)=   0.650 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  40.088
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   2.939 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.085
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17       47.72
       0.16   412.86    .357E+02       0.0          0.28       30.06
       0.24   412.94    .804E+02       0.1          0.36       22.94
       0.32   413.02    .143E+03       0.1          0.44       18.94
       0.39   413.09    .223E+03       0.2          0.51       16.32
       0.47   413.17    .322E+03       0.4          0.58       14.45
       0.55   413.25    .438E+03       0.6          0.64       13.04
       0.63   413.33    .572E+03       0.8          0.70       11.93
       0.71   413.41    .724E+03       1.1          0.76       11.03
       0.79   413.49    .893E+03       1.4          0.81       10.28
       0.87   413.57    .108E+04       1.9          0.86        9.65
       0.95   413.65    .129E+04       2.4          0.92        9.10
       1.03   413.73    .151E+04       2.9          0.97        8.63
       1.11   413.81    .175E+04       3.6          1.01        8.22
       1.18   413.88    .201E+04       4.3          1.06        7.85
       1.26   413.96    .229E+04       5.1          1.11        7.52
       1.34   414.04    .258E+04       6.0          1.15        7.22
       1.42   414.12    .289E+04       6.9          1.20        6.95
       1.50   414.20    .323E+04       8.0          1.24        6.70

                                  <---- hydrograph ---->   <-pipe / channel->
                                   AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                   (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0630)   33.04     2.94    1.83  40.08      1.03      0.97
  OUTFLOW: ID= 1 (  4630)   33.04     2.76    2.00  40.08      1.00      0.95


--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2623):   727.82  27.644     2.67    41.71
     + ID2= 2 (  4630):    33.04   2.762     2.00    40.08
       ================================================
       ID = 3 (  2637):   760.86  29.086     2.58    41.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   760.86  29.086     2.58    41.64
     + ID2= 2 (  0637):     8.36   0.650     1.92    40.09
       ================================================
       ID = 1 (  2637):   769.22  29.480     2.58    41.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.255 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  40.088
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   769.22  29.480     2.58    41.63
     + ID2= 2 (  0636):     3.32   0.255     2.00    40.09
       ================================================
```

```
        ID = 3 (  2636):   772.54  29.639     2.58    41.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.379 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  40.087
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   1.630 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  40.088
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2636):   772.54  29.639     2.58    41.62
      + ID2= 2 (  0638):    20.63   1.630     1.92    40.09
        ================================================
        ID = 3 (  2630):   793.17  30.663     2.50    41.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2630):   793.17  30.663     2.50    41.58
      + ID2= 2 (  0639):     4.60   0.379     1.92    40.09
        ================================================
        ID = 1 (  2630):   797.77  30.888     2.50    41.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
 FINISH
--------------------------------------------------------------------------------
--------------------
  ***********************************************
  ** SIMULATION : Hazel                        **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\TNuman\AppD
|                  |              ata\Local\Temp\
|                  |              1105c3bc-ce2c-45a5-ba64-de66a0889104\098df982
| Ptotal=212.00 mm |    Comments: Hazel
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    6.00 |  3.00   13.00 |  6.00   23.00 |  9.00   53.00
                1.00    4.00 |  4.00   17.00 |  7.00   13.00 | 10.00   38.00
                2.00    6.00 |  5.00   13.00 |  8.00   13.00 | 11.00   13.00

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

                        ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.033    6.00 | 3.033   13.00 | 6.033   23.00 |  9.03   53.00
               0.067    6.00 | 3.067   13.00 | 6.067   23.00 |  9.07   53.00
               0.100    6.00 | 3.100   13.00 | 6.100   23.00 |  9.10   53.00
               0.133    6.00 | 3.133   13.00 | 6.133   23.00 |  9.13   53.00
               0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
               0.200    6.00 | 3.200   13.00 | 6.200   23.00 |  9.20   53.00
               0.233    6.00 | 3.233   13.00 | 6.233   23.00 |  9.23   53.00
               0.267    6.00 | 3.267   13.00 | 6.267   23.00 |  9.27   53.00
               0.300    6.00 | 3.300   13.00 | 6.300   23.00 |  9.30   53.00
               0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
               0.367    6.00 | 3.367   13.00 | 6.367   23.00 |  9.37   53.00
               0.400    6.00 | 3.400   13.00 | 6.400   23.00 |  9.40   53.00
               0.433    6.00 | 3.433   13.00 | 6.433   23.00 |  9.43   53.00
               0.467    6.00 | 3.467   13.00 | 6.467   23.00 |  9.47   53.00
               0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
               0.533    6.00 | 3.533   13.00 | 6.533   23.00 |  9.53   53.00
               0.567    6.00 | 3.567   13.00 | 6.567   23.00 |  9.57   53.00
               0.600    6.00 | 3.600   13.00 | 6.600   23.00 |  9.60   53.00
               0.633    6.00 | 3.633   13.00 | 6.633   23.00 |  9.63   53.00
               0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
               0.700    6.00 | 3.700   13.00 | 6.700   23.00 |  9.70   53.00
               0.733    6.00 | 3.733   13.00 | 6.733   23.00 |  9.73   53.00
               0.767    6.00 | 3.767   13.00 | 6.767   23.00 |  9.77   53.00
               0.800    6.00 | 3.800   13.00 | 6.800   23.00 |  9.80   53.00
               0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
               0.867    6.00 | 3.867   13.00 | 6.867   23.00 |  9.87   53.00
               0.900    6.00 | 3.900   13.00 | 6.900   23.00 |  9.90   53.00
               0.933    6.00 | 3.933   13.00 | 6.933   23.00 |  9.93   53.00
               0.967    6.00 | 3.967   13.00 | 6.967   23.00 |  9.97   53.00
```

1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

Unit Hyd Qpeak (cms)= 4.464

PEAK FLOW (cms)= 13.246 (i)
TIME TO PEAK (hrs)= 11.300
RUNOFF VOLUME (mm)= 170.153
TOTAL RAINFALL (mm)= 211.999
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0205)	Area (ha)=	4.80	Curve Number (CN)=	96.0	
ID= 1 DT= 2.0 min	Ia (mm)=	1.50	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.41			

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00

1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

Unit Hyd Qpeak (cms)= 0.447

PEAK FLOW (cms)= 0.652 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 200.421
TOTAL RAINFALL (mm)= 211.999
RUNOFF COEFFICIENT = 0.945

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

| STANDHYD (0206)| Area (ha)= 0.20
|ID= 1 DT= 2.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.09	0.11
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	25.00	25.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00

1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

			TOTALS
Max.Eff.Inten.(mm/hr)=	53.00	70.29	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.36 (ii)	8.50 (ii)	
Unit Hyd. Tpeak (min)=	4.00	10.00	
Unit Hyd. peak (cms)=	0.47	0.13	
PEAK FLOW (cms)=	0.01	0.02	0.029 (iii)
TIME TO PEAK (hrs)=	9.33	10.00	10.00
RUNOFF VOLUME (mm)=	210.00	181.86	188.87
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.86	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0201)	Area (ha)= 14.60	Curve Number (CN)= 88.0	
ID= 1 DT= 2.0 min	Ia (mm)= 1.50	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.97		

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00

1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

Unit Hyd Qpeak (cms)= 0.575

PEAK FLOW (cms)= 1.537 (i)
TIME TO PEAK (hrs)= 11.133
RUNOFF VOLUME (mm)= 180.756
TOTAL RAINFALL (mm)= 211.999
RUNOFF COEFFICIENT = 0.853

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0203)	Area (ha)= 8.20
ID= 1 DT= 2.0 min	Total Imp(%)= 45.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.69	4.51
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	25.00	25.00

Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00

1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

Max.Eff.Inten.(mm/hr)=	53.00	70.29		
over (min)	5.00	10.00		
Storage Coeff. (min)=	1.36 (ii)	8.50 (ii)		
Unit Hyd. Tpeak (min)=	4.00	10.00		
Unit Hyd. peak (cms)=	0.47	0.13		
			TOTALS	
PEAK FLOW (cms)=	0.30	0.88	1.179 (iii)	
TIME TO PEAK (hrs)=	9.40	10.00	10.00	
RUNOFF VOLUME (mm)=	210.00	181.86	188.90	
TOTAL RAINFALL (mm)=	212.00	212.00	212.00	
RUNOFF COEFFICIENT =	0.99	0.86	0.89	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2200) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	14.60	1.537	11.13	180.76
+ ID2= 2 (0203):	8.20	1.179	10.00	188.90
ID = 3 (2200):	22.80	2.381	11.00	183.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2201) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0205):	4.80	0.652	10.17	200.42
+ ID2= 2 (0206):	0.20	0.029	10.00	188.87
ID = 3 (2201):	5.00	0.677	10.13	199.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2201) | 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2201):	5.00	0.677	10.13	199.96
+ ID2= 2 (2200):	22.80	2.381	11.00	183.68
ID = 1 (2201):	27.80	2.930	11.00	186.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | STANDHYD (0209) | ID= 1 DT= 2.0 min	Area (ha)= 2.70	Total Imp(%)= 16.00	Dir. Conn.(%)= 8.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.43	2.27
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	35.00	35.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00

0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

			TOTALS
Max.Eff.Inten.(mm/hr)=	53.00	55.75	
over (min)	5.00	12.00	
Storage Coeff. (min)=	1.66 (ii)	11.25 (ii)	
Unit Hyd. Tpeak (min)=	4.00	12.00	
Unit Hyd. peak (cms)=	0.44	0.10	
PEAK FLOW (cms)=	0.03	0.35	0.379 (iii)
TIME TO PEAK (hrs)=	9.43	10.00	10.00
RUNOFF VOLUME (mm)=	210.00	175.49	178.25
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.83	0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0207)	Area (ha)=	1.30	
ID= 1 DT= 2.0 min	Total Imp(%)=	45.00	Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.58	0.72
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	25.00	25.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00

0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

			TOTALS
Max.Eff.Inten.(mm/hr)=	53.00	70.29	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.36 (ii)	8.50 (ii)	
Unit Hyd. Tpeak (min)=	4.00	10.00	
Unit Hyd. peak (cms)=	0.47	0.13	
PEAK FLOW (cms)=	0.05	0.14	0.187 (iii)
TIME TO PEAK (hrs)=	9.37	10.00	10.00
RUNOFF VOLUME (mm)=	210.00	181.86	188.89
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.86	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2202)| 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0207):	1.30	0.187	10.00	188.89
+ ID2= 2 (0209):	2.70	0.379	10.00	178.25
ID = 3 (2202):	4.00	0.566	10.00	181.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2202)| 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2202):	4.00	0.566	10.00	181.71
+ ID2= 2 (2201):	27.80	2.930	11.00	186.61
ID = 1 (2202):	31.80	3.457	10.00	185.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98  13.246    11.30   170.15
     + ID2= 2 (  2202):    31.80   3.457    10.00   185.99
       ================================================
       ID = 3 (  2100):   168.78  16.204    11.03   173.14

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 88.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

```
Unit Hyd Qpeak  (cms)=   0.246

PEAK FLOW       (cms)=   0.372 (i)
TIME TO PEAK    (hrs)=  10.200
RUNOFF VOLUME    (mm)= 180.755
TOTAL RAINFALL   (mm)= 211.999
RUNOFF COEFFICIENT   =   0.853

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.98         2.42
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

```
     Max.Eff.Inten.(mm/hr)=      53.00        70.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      1.43 (ii)    8.98 (ii)
     Unit Hyd. Tpeak (min)=      4.00        10.00
     Unit Hyd. peak  (cms)=      0.46         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.16         0.47          0.632 (iii)
     TIME TO PEAK    (hrs)=      9.40        10.00         10.00
     RUNOFF VOLUME    (mm)=    210.00       181.86        188.89
     TOTAL RAINFALL   (mm)=    212.00       212.00        212.00
     RUNOFF COEFFICIENT   =      0.99         0.86          0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  86.0    Ia = Dep. Storage  (Above)
```

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2300)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0302):	2.90	0.372	10.20	180.76
+	ID2= 2 (0304):	4.40	0.632	10.00	188.89
	ID = 3 (2300):	7.30	0.987	10.00	185.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0308)	Area (ha)= 0.20		
ID= 1 DT= 2.0 min	Total Imp(%)= 45.00	Dir. Conn.(%)= 25.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.09	0.11
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	25.00	25.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

Max.Eff.Inten.(mm/hr)=	53.00	70.29	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.43 (ii)	8.98 (ii)	
Unit Hyd. Tpeak (min)=	4.00	10.00	
Unit Hyd. peak (cms)=	0.46	0.12	
			TOTALS
PEAK FLOW (cms)=	0.01	0.02	0.029 (iii)
TIME TO PEAK (hrs)=	9.33	10.00	10.00
RUNOFF VOLUME (mm)=	210.00	181.86	188.87
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.86	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0310) | Area (ha)= 5.70
ID= 1 DT= 2.0 min | Total Imp(%)= 16.00 Dir. Conn.(%)= 8.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.91	4.79
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	25.00	25.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00

2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

Max.Eff.Inten.(mm/hr)=		53.00	55.75	
over (min)		5.00	10.00	
Storage Coeff. (min)=		1.36 (ii)	9.20 (ii)	
Unit Hyd. Tpeak (min)=		4.00	10.00	
Unit Hyd. peak (cms)=		0.47	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.07	0.74	0.804 (iii)
TIME TO PEAK	(hrs)=	9.37	10.00	10.00
RUNOFF VOLUME	(mm)=	210.00	175.49	178.25
TOTAL RAINFALL	(mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT	=	0.99	0.83	0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2301)
1 + 2 = 3

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2300):		7.30	0.987	10.00	185.66
+ ID2= 2 (0308):		0.20	0.029	10.00	188.87
ID = 3 (2301):		7.50	1.016	10.00	185.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2301)
3 + 2 = 1

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (2301):		7.50	1.016	10.00	185.75
+ ID2= 2 (0310):		5.70	0.804	10.00	178.25
ID = 1 (2301):		13.20	1.821	10.00	182.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2302)
1 + 2 = 3

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2100):		168.78	16.204	11.03	173.14
+ ID2= 2 (2301):		13.20	1.821	10.00	182.51
ID = 3 (2302):		181.98	17.576	11.00	173.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0400)
ID= 1 DT= 2.0 min

Area (ha)= 82.86
Total Imp(%)= 10.00 Dir. Conn.(%)= 3.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	8.29	74.57
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	0.70	2.00
Length	(m)=	1437.00	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.033	6.00	3.033	13.00	6.033	23.00	9.03	53.00
0.067	6.00	3.067	13.00	6.067	23.00	9.07	53.00
0.100	6.00	3.100	13.00	6.100	23.00	9.10	53.00
0.133	6.00	3.133	13.00	6.133	23.00	9.13	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.200	6.00	3.200	13.00	6.200	23.00	9.20	53.00
0.233	6.00	3.233	13.00	6.233	23.00	9.23	53.00
0.267	6.00	3.267	13.00	6.267	23.00	9.27	53.00
0.300	6.00	3.300	13.00	6.300	23.00	9.30	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.367	6.00	3.367	13.00	6.367	23.00	9.37	53.00
0.400	6.00	3.400	13.00	6.400	23.00	9.40	53.00
0.433	6.00	3.433	13.00	6.433	23.00	9.43	53.00
0.467	6.00	3.467	13.00	6.467	23.00	9.47	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.533	6.00	3.533	13.00	6.533	23.00	9.53	53.00
0.567	6.00	3.567	13.00	6.567	23.00	9.57	53.00
0.600	6.00	3.600	13.00	6.600	23.00	9.60	53.00
0.633	6.00	3.633	13.00	6.633	23.00	9.63	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.700	6.00	3.700	13.00	6.700	23.00	9.70	53.00
0.733	6.00	3.733	13.00	6.733	23.00	9.73	53.00
0.767	6.00	3.767	13.00	6.767	23.00	9.77	53.00
0.800	6.00	3.800	13.00	6.800	23.00	9.80	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.867	6.00	3.867	13.00	6.867	23.00	9.87	53.00
0.900	6.00	3.900	13.00	6.900	23.00	9.90	53.00
0.933	6.00	3.933	13.00	6.933	23.00	9.93	53.00
0.967	6.00	3.967	13.00	6.967	23.00	9.97	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	52.99
1.033	4.00	4.033	17.00	7.033	13.00	10.03	38.00
1.067	4.00	4.067	17.00	7.067	13.00	10.07	38.00
1.100	4.00	4.100	17.00	7.100	13.00	10.10	38.00
1.133	4.00	4.133	17.00	7.133	13.00	10.13	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.200	4.00	4.200	17.00	7.200	13.00	10.20	38.00
1.233	4.00	4.233	17.00	7.233	13.00	10.23	38.00
1.267	4.00	4.267	17.00	7.267	13.00	10.27	38.00
1.300	4.00	4.300	17.00	7.300	13.00	10.30	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.367	4.00	4.367	17.00	7.367	13.00	10.37	38.00
1.400	4.00	4.400	17.00	7.400	13.00	10.40	38.00
1.433	4.00	4.433	17.00	7.433	13.00	10.43	38.00
1.467	4.00	4.467	17.00	7.467	13.00	10.47	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00

1.533	4.00	4.533	17.00	7.533	13.00	10.53	38.00
1.567	4.00	4.567	17.00	7.567	13.00	10.57	38.00
1.600	4.00	4.600	17.00	7.600	13.00	10.60	38.00
1.633	4.00	4.633	17.00	7.633	13.00	10.63	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.700	4.00	4.700	17.00	7.700	13.00	10.70	38.00
1.733	4.00	4.733	17.00	7.733	13.00	10.73	38.00
1.767	4.00	4.767	17.00	7.767	13.00	10.77	38.00
1.800	4.00	4.800	17.00	7.800	13.00	10.80	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.867	4.00	4.867	17.00	7.867	13.00	10.87	38.00
1.900	4.00	4.900	17.00	7.900	13.00	10.90	38.00
1.933	4.00	4.933	17.00	7.933	13.00	10.93	38.00
1.967	4.00	4.967	17.00	7.967	13.00	10.97	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	37.98
2.033	6.00	5.033	13.00	8.033	13.00	11.03	13.00
2.067	6.00	5.067	13.00	8.067	13.00	11.07	13.00
2.100	6.00	5.100	13.00	8.100	13.00	11.10	13.00
2.133	6.00	5.133	13.00	8.133	13.00	11.13	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.200	6.00	5.200	13.00	8.200	13.00	11.20	13.00
2.233	6.00	5.233	13.00	8.233	13.00	11.23	13.00
2.267	6.00	5.267	13.00	8.267	13.00	11.27	13.00
2.300	6.00	5.300	13.00	8.300	13.00	11.30	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.367	6.00	5.367	13.00	8.367	13.00	11.37	13.00
2.400	6.00	5.400	13.00	8.400	13.00	11.40	13.00
2.433	6.00	5.433	13.00	8.433	13.00	11.43	13.00
2.467	6.00	5.467	13.00	8.467	13.00	11.47	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.533	6.00	5.533	13.00	8.533	13.00	11.53	13.00
2.567	6.00	5.567	13.00	8.567	13.00	11.57	13.00
2.600	6.00	5.600	13.00	8.600	13.00	11.60	13.00
2.633	6.00	5.633	13.00	8.633	13.00	11.63	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.700	6.00	5.700	13.00	8.700	13.00	11.70	13.00
2.733	6.00	5.733	13.00	8.733	13.00	11.73	13.00
2.767	6.00	5.767	13.00	8.767	13.00	11.77	13.00
2.800	6.00	5.800	13.00	8.800	13.00	11.80	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.867	6.00	5.867	13.00	8.867	13.00	11.87	13.00
2.900	6.00	5.900	13.00	8.900	13.00	11.90	13.00
2.933	6.00	5.933	13.00	8.933	13.00	11.93	13.00
2.967	6.00	5.967	13.00	8.967	13.00	11.97	13.00
3.000	6.00	6.000	13.00	9.000	13.01	12.00	12.98

Max.Eff.Inten.(mm/hr)=	53.00	54.48	
over (min)	18.00	28.00	
Storage Coeff. (min)=	18.14 (ii)	27.14 (ii)	
Unit Hyd. Tpeak (min)=	18.00	28.00	
Unit Hyd. peak (cms)=	0.06	0.04	
			TOTALS
PEAK FLOW (cms)=	0.35	9.88	10.218 (iii)
TIME TO PEAK (hrs)=	10.03	10.23	10.23
RUNOFF VOLUME (mm)=	209.99	172.71	173.84
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.81	0.82

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2400)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2302):		181.98	17.576	11.00	173.82
+ ID2= 2 (0400):		82.86	10.218	10.23	173.84
ID = 3 (2400):		264.84	26.422	11.00	173.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4400)					
IN= 2---> OUT= 1	Routing time step (min)'= 2.00				
<------ DATA FOR SECTION (1.1) ------>					
Distance	Elevation	Manning			
0.00	411.10	0.0550			
27.30	410.20	0.0550			
77.50	409.10	0.0550			
96.60	409.10	0.0550			
115.80	408.90	0.0550			
124.80	409.10	0.0550			
131.00	408.90	0.0550 /0.0350	Main Channel		
133.60	408.00	0.0350	Main Channel		
134.40	407.60	0.0350	Main Channel		
135.00	407.50	0.0350	Main Channel		
135.80	407.60	0.0350	Main Channel		
136.50	408.00	0.0350	Main Channel		
139.40	408.80	0.0350 /0.0550	Main Channel		
143.50	408.90	0.0550			
148.50	408.70	0.0550			
163.80	408.90	0.0550			
183.20	408.90	0.0550			
243.70	409.70	0.0550			
278.70	410.20	0.0550			
330.50	411.40	0.0550			

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.19	407.69	.366E+03	0.1	0.51	58.83
0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66

3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 2400)	264.84	26.42	11.00	173.82	1.63	0.94
OUTFLOW: ID= 1 (| 4400)	264.84	24.70	11.33	173.82	1.61	0.96

CALIB					
NASHYD (	0510)	Area (ha)=	90.75	Curve Number (CN)=	86.0
ID= 1 DT= 5.0 min		Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	1.70		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 2.039

PEAK FLOW (cms)= 7.570 (i)
TIME TO PEAK (hrs)= 11.750
RUNOFF VOLUME (mm)= 172.536
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4510)		
IN= 2---> OUT= 1	Routing time step (min)'=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350 /0.0350	Main Channel
8.20	414.20	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00	0.0350	Main Channel
-0.00	0.00

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN
-Inf	-Inf	.000E+00	0.0	NaN	NaN

**** WARNING: INFLOW HYDROGRAPH IS DRY!!

CALIB				
NASHYD (0511)	Area (ha)= 54.65	Curve Number (CN)= 86.0		
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 0.52			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 4.014

PEAK FLOW (cms)= 6.638 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 172.528
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0516)	Area (ha)= 11.47	Curve Number (CN)= 86.0		
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 0.56			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00

2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.782

PEAK FLOW (cms)= 1.367 (i)
TIME TO PEAK (hrs)= 10.333
RUNOFF VOLUME (mm)= 172.530
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ROUTE CHN(4516)| IN= 2---> OUT= 1 | Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.125E+02	0.0	0.27	43.74
0.16	412.86	.500E+02	0.0	0.42	27.55
0.24	412.94	.113E+03	0.1	0.55	21.03
0.32	413.02	.200E+03	0.2	0.67	17.36
0.39	413.09	.313E+03	0.3	0.78	14.96
0.47	413.17	.450E+03	0.6	0.88	13.25
0.55	413.25	.613E+03	0.9	0.98	11.95
0.63	413.33	.801E+03	1.2	1.07	10.93
0.71	413.41	.101E+04	1.7	1.15	10.11
0.79	413.49	.125E+04	2.2	1.24	9.42
0.87	413.57	.151E+04	2.9	1.32	8.84
0.95	413.65	.180E+04	3.6	1.40	8.34
1.03	413.73	.211E+04	4.5	1.47	7.91
1.11	413.81	.245E+04	5.4	1.55	7.53
1.18	413.88	.281E+04	6.5	1.62	7.19
1.26	413.96	.320E+04	7.7	1.69	6.89
1.34	414.04	.362E+04	9.1	1.76	6.62
1.42	414.12	.405E+04	10.6	1.83	6.37
1.50	414.20	.452E+04	12.3	1.90	6.14

		<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0516)	11.47	1.37	10.33	172.53	0.66	1.09
OUTFLOW:	ID= 1 (4516)	11.47	1.35	10.50	172.51	0.65	1.09

ADD HYD (2510)|	1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (4516):	11.47	1.348	10.50	172.51
+ ID2= 2 (0511):	54.65	6.638	10.25	172.53
ID = 3 (2510):	66.12	7.960	10.33	172.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | NASHYD (0517)| ID= 1 DT= 5.0 min | Area (ha)= 1.75 | Curve Number (CN)= 86.0 | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.32

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

<---- TRANSFORMED HYETOGRAPH ---->

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.209

PEAK FLOW (cms)= 0.235 (i)

TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 172.484
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2511)|		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3			(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2510):		66.12	7.960	10.33	172.52
	+ ID2= 2 (4510):		90.75	7.570	11.75	172.54
	ID = 3 (2511):		156.87	14.070	11.08	172.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2511)|		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1			(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (2511):		156.87	14.070	11.08	172.53
	+ ID2= 2 (0517):		1.75	0.235	10.08	172.48
	ID = 1 (2511):		158.62	14.245	11.08	172.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0512)| ID= 1 DT= 5.0 min	Area (ha)= 31.10	Curve Number (CN)= 86.0		
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 0.71			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.673

PEAK FLOW (cms)= 3.478 (i)
TIME TO PEAK (hrs)= 10.667
RUNOFF VOLUME (mm)= 172.533
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0514)| ID= 1 DT= 5.0 min	Area (ha)= 2.65	Curve Number (CN)= 80.0		
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 0.60			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00

1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.169

PEAK FLOW (cms)= 0.294 (i)
TIME TO PEAK (hrs)= 10.417
RUNOFF VOLUME (mm)= 158.402
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.747

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0515)	Area (ha)=	5.41	Curve Number (CN)= 80.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.41	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.504

PEAK FLOW (cms)= 0.662 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 158.389
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.747

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0513)	Area (ha)=	6.68	Curve Number (CN)= 86.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.20	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00

2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.276

PEAK FLOW (cms)= 0.930 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 172.207
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.812

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2512)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2511):	158.62	14.245	11.08	172.53
+ ID2= 2 (0512):	31.10	3.478	10.67	172.53
ID = 3 (2512):	189.72	17.641	11.00	172.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2512)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2512):	189.72	17.641	11.00	172.53
+ ID2= 2 (0513):	6.68	0.930	10.00	172.21
ID = 1 (2512):	196.40	18.321	11.00	172.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2512)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2512):	196.40	18.321	11.00	172.52
+ ID2= 2 (0514):	2.65	0.294	10.42	158.40
ID = 3 (2512):	199.05	18.601	11.00	172.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2512)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2512):	199.05	18.601	11.00	172.33
+ ID2= 2 (0515):	5.41	0.662	10.17	158.39
ID = 1 (2512):	204.46	19.152	11.00	171.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2513)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2512):	204.46	19.152	11.00	171.96
+ ID2= 2 (4400):	264.84	24.698	11.33	173.82
ID = 3 (2513):	469.30	43.368	11.10	173.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0520) ID= 1 DT= 5.0 min

Area (ha)= 108.36 Curve Number (CN)= 86.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 1.20

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00

2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 3.449

PEAK FLOW (cms)= 10.462 (i)
TIME TO PEAK (hrs)= 11.333
RUNOFF VOLUME (mm)= 172.535
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2520)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2513):	469.30	43.368	11.10	173.01
	+ ID2= 2 (0520):	108.36	10.462	11.33	172.54
	ID = 3 (2520):	577.66	53.758	11.17	172.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4500)			
IN= 2---> OUT= 1	Routing time step (min)'= 2.00		

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	409.70	0.0550	
19.70	408.80	0.0550	
41.70	407.20	0.0550	
60.50	405.30	0.0550	
80.00	404.50	0.0550	
95.70	404.60	0.0550 /0.0350	Main Channel
98.60	403.40	0.0350	Main Channel
100.40	403.40	0.0350	Main Channel
100.80	402.90	0.0350	Main Channel
101.50	402.70	0.0350	Main Channel
102.30	402.80	0.0350	Main Channel
103.30	403.20	0.0350	Main Channel
104.00	403.20	0.0350	Main Channel
105.60	404.40	0.0350 /0.0550	Main Channel
109.70	404.30	0.0550	
128.60	404.20	0.0550	
154.10	405.40	0.0550	
179.10	406.70	0.0550	
201.90	408.60	0.0550	
224.20	410.60	0.0550	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.34	403.04	.954E+03	0.3	0.70	47.40
0.68	403.38	.304E+04	1.6	1.03	32.27
1.02	403.72	.718E+04	4.5	1.25	26.57
1.36	404.06	.122E+05	9.7	1.58	20.96
1.70	404.40	.251E+05	18.1	1.44	23.04
2.08	404.78	.650E+05	42.3	1.29	25.62
2.46	405.16	.122E+06	86.3	1.40	23.62
2.84	405.54	.192E+06	151.6	1.57	21.10
3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85
4.35	407.05	.554E+06	631.1	2.26	14.63
4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2520)		577.66	53.76	11.17	172.92	2.18	1.32
OUTFLOW: ID= 1 (4500)		577.66	51.55	11.47	172.92	2.15	1.31

CALIB			
NASHYD (0610)	Area (ha)=	78.05	Curve Number (CN)= 86.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.00	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00

2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 2.981

PEAK FLOW (cms)= 8.022 (i)
TIME TO PEAK (hrs)= 11.167
RUNOFF VOLUME (mm)= 172.535
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2610)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (4500):		577.66	51.549	11.47	172.92
+ ID2= 2 (0610):		78.05	8.022	11.17	172.54
ID = 3 (2610):		655.71	59.288	11.43	172.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0623)					
ID= 1 DT= 5.0 min	Area (ha)=	19.37	Curve Number (CN)=	85.0	
	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.45			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.644

PEAK FLOW (cms)= 2.425 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 170.142
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0625)					
ID= 1 DT= 5.0 min	Area (ha)=	6.72	Curve Number (CN)=	85.0	
	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.39			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00

2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.868 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.132
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4625)
IN= 2---> OUT= 1

Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0360	Main Channel
4.30	412.70	0.0360	Main Channel
8.60	414.20	0.0360	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.108E+02	0.0	0.24	42.13
0.16	412.86	.434E+02	0.0	0.38	26.54
0.24	412.94	.976E+02	0.1	0.50	20.26
0.32	413.02	.174E+03	0.2	0.61	16.72
0.39	413.09	.271E+03	0.3	0.70	14.41
0.47	413.17	.390E+03	0.5	0.79	12.76
0.55	413.25	.532E+03	0.8	0.88	11.51
0.63	413.33	.694E+03	1.1	0.96	10.53
0.71	413.41	.879E+03	1.5	1.04	9.74
0.79	413.49	.108E+04	2.0	1.11	9.08
0.87	413.57	.131E+04	2.6	1.19	8.52
0.95	413.65	.156E+04	3.2	1.26	8.04
1.03	413.73	.183E+04	4.0	1.33	7.62
1.11	413.81	.213E+04	4.9	1.39	7.25
1.18	413.88	.244E+04	5.9	1.46	6.93
1.26	413.96	.278E+04	7.0	1.52	6.64
1.34	414.04	.313E+04	8.2	1.59	6.37
1.42	414.12	.351E+04	9.5	1.65	6.13
1.50	414.20	.392E+04	11.0	1.71	5.92

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0625)	6.72	0.87	10.08	170.13	0.58	0.90
OUTFLOW: ID= 1 (4625)	6.72	0.85	10.25	170.10	0.57	0.89

CALIB	
NASHYD (0622)	Area (ha)= 9.69 Curve Number (CN)= 85.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.36

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.028

PEAK FLOW (cms)= 1.273 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.123
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.802

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB           |
| NASHYD  (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.37
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.857 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.126
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.802

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB           |
| NASHYD  (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.51
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.887

PEAK FLOW (cms)= 1.435 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 170.147
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB           |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.64	0.42
Dep. Storage	(mm)=	1.00	10.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	84.06	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=		53.00	63.74	
over (min)		5.00	15.00	
Storage Coeff. (min)=		2.97 (ii)	11.42 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.28	0.09	
				TOTALS
PEAK FLOW	(cms)=	0.08	0.07	0.152 (iii)
TIME TO PEAK	(hrs)=	9.75	10.00	10.00
RUNOFF VOLUME	(mm)=	211.00	173.50	192.25
TOTAL RAINFALL	(mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT	=	1.00	0.82	0.91

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2621)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (4625):	6.72	0.847	10.25	170.10
+ ID2= 2 (0621):	6.56	0.857	10.08	170.13
ID = 3 (2621):	13.28	1.692	10.17	170.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	13.28	1.692	10.17	170.11
+ ID2= 2 (0622):	9.69	1.273	10.08	170.12
ID = 1 (2621):	22.97	2.953	10.17	170.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2621):	22.97	2.953	10.17	170.12
+ ID2= 2 (0623):	19.37	2.425	10.17	170.14
ID = 3 (2621):	42.34	5.378	10.17	170.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	42.34	5.378	10.17	170.13
+ ID2= 2 (0624):	11.84	1.435	10.25	170.15
ID = 1 (2621):	54.18	6.802	10.17	170.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2621):	54.18	6.802	10.17	170.13
+ ID2= 2 (0626):	1.06	0.152	10.00	192.25

```
================================================
ID = 3 (  2621):    55.24   6.928    10.17   170.56
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20
```

NOTE: RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)=   1.793

PEAK FLOW   (cms)=   1.298 (i)
TIME TO PEAK   (hrs)= 10.000
RUNOFF VOLUME   (mm)= 169.831
TOTAL RAINFALL   (mm)= 212.000
RUNOFF COEFFICIENT   =   0.801

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  6200)|   Area    (ha)=   6.66   Curve Number   (CN)= 86.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.28
```

NOTE: RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)=   0.908

PEAK FLOW   (cms)=   0.912 (i)
TIME TO PEAK   (hrs)= 10.000
RUNOFF VOLUME   (mm)= 172.448
TOTAL RAINFALL   (mm)= 212.000
RUNOFF COEFFICIENT   =   0.813

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------------------------------------------------------------------
--------------------
```

```
| CALIB           |
| NASHYD   (  6201)|   Area    (ha)=   0.82   Curve Number   (CN)= 86.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.15

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

```
     Unit Hyd Qpeak  (cms)=   0.209

     PEAK FLOW       (cms)=   0.114 (i)
     TIME TO PEAK    (hrs)=  10.000
     RUNOFF VOLUME    (mm)= 171.540
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.809

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6200):     6.66   0.912    10.00   172.45
     + ID2= 2 (  6201):     0.82   0.114    10.00   171.54
       ================================================
       ID = 3 (  0113):     7.48   1.026    10.00   172.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55       7.70
       0.16   412.86    .182E+02       0.1          0.88       4.85
       0.24   412.94    .410E+02       0.2          1.15       3.70
       0.32   413.02    .729E+02       0.4          1.39       3.05
       0.39   413.09    .114E+03       0.7          1.61       2.63
       0.47   413.17    .164E+03       1.2          1.82       2.33
       0.55   413.25    .223E+03       1.8          2.02       2.10
       0.63   413.33    .292E+03       2.5          2.21       1.92
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                    <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
     INFLOW : ID= 2 (  0113)    7.48     1.03   10.00 172.35      0.45       1.75
     OUTFLOW: ID= 1 (  4620)    7.48     1.02   10.00 172.35      0.45       1.75


--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4620):     7.48   1.022    10.00   172.35
     + ID2= 2 (  0627):     9.39   1.298    10.00   169.83
       ================================================
       ID = 3 (  2620):    16.87   2.321    10.00   170.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):    16.87   2.321    10.00   170.95
     + ID2= 2 (  2621):    55.24   6.928    10.17   170.56
       ================================================
       ID = 3 (  2622):    72.11   9.152    10.08   170.65
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ADD HYD  (  2623)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2610):   655.71  59.288    11.43   172.88
     + ID2= 2 (  2622):    72.11   9.152    10.08   170.65
       ================================================
       ID = 3 (  2623):   727.82  65.164    11.23   172.65
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.679

PEAK FLOW (cms)= 1.035 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 170.144
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00

2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 3.321

PEAK FLOW (cms)= 4.294 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.129
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.802

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ROUTE CHN(4630)| IN= 2---> OUT= 1 | Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.893E+01	0.0	0.17	47.72
0.16	412.86	.357E+02	0.0	0.28	30.06
0.24	412.94	.804E+02	0.1	0.36	22.94
0.32	413.02	.143E+03	0.1	0.44	18.94
0.39	413.09	.223E+03	0.2	0.51	16.32
0.47	413.17	.322E+03	0.4	0.58	14.45
0.55	413.25	.438E+03	0.6	0.64	13.04
0.63	413.33	.572E+03	0.8	0.70	11.93
0.71	413.41	.724E+03	1.1	0.76	11.03
0.79	413.49	.893E+03	1.4	0.81	10.28
0.87	413.57	.108E+04	1.9	0.86	9.65
0.95	413.65	.129E+04	2.4	0.92	9.10
1.03	413.73	.151E+04	2.9	0.97	8.63
1.11	413.81	.175E+04	3.6	1.01	8.22
1.18	413.88	.201E+04	4.3	1.06	7.85
1.26	413.96	.229E+04	5.1	1.11	7.52
1.34	414.04	.258E+04	6.0	1.15	7.22
1.42	414.12	.289E+04	6.9	1.20	6.95
1.50	414.20	.323E+04	8.0	1.24	6.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0630)	33.04	4.29	10.08	170.13	1.19	1.06
OUTFLOW: ID= 1 (4630)	33.04	4.23	10.17	170.12	1.18	1.06

ADD HYD (2637)| 1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2623):	727.82	65.164	11.23	172.65
+ ID2= 2 (4630):	33.04	4.228	10.17	170.12
ID = 3 (2637):	760.86	68.454	11.17	172.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2637)| 3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2637):	760.86	68.454	11.17	172.54
+ ID2= 2 (0637):	8.36	1.035	10.25	170.14
ID = 1 (2637):	769.22	69.299	11.17	172.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	NASHYD (0636)	ID= 1 DT= 5.0 min				
	Area (ha)=	3.32	Curve Number (CN)=	85.0		
	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00		
	U.H. Tp(hrs)=	0.48				

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00

2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.264

PEAK FLOW (cms)= 0.409 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 170.145
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2636)|				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2637):	769.22	69.299	11.17	172.52
+ ID2= 2 (0636):	3.32	0.409	10.25	170.14
ID = 3 (2636):	772.54	69.635	11.17	172.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB |				
NASHYD (0639)|	Area (ha)=	4.60	Curve Number (CN)=	85.0
ID= 1 DT= 5.0 min |	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.43		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.409

PEAK FLOW (cms)= 0.582 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 170.139
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

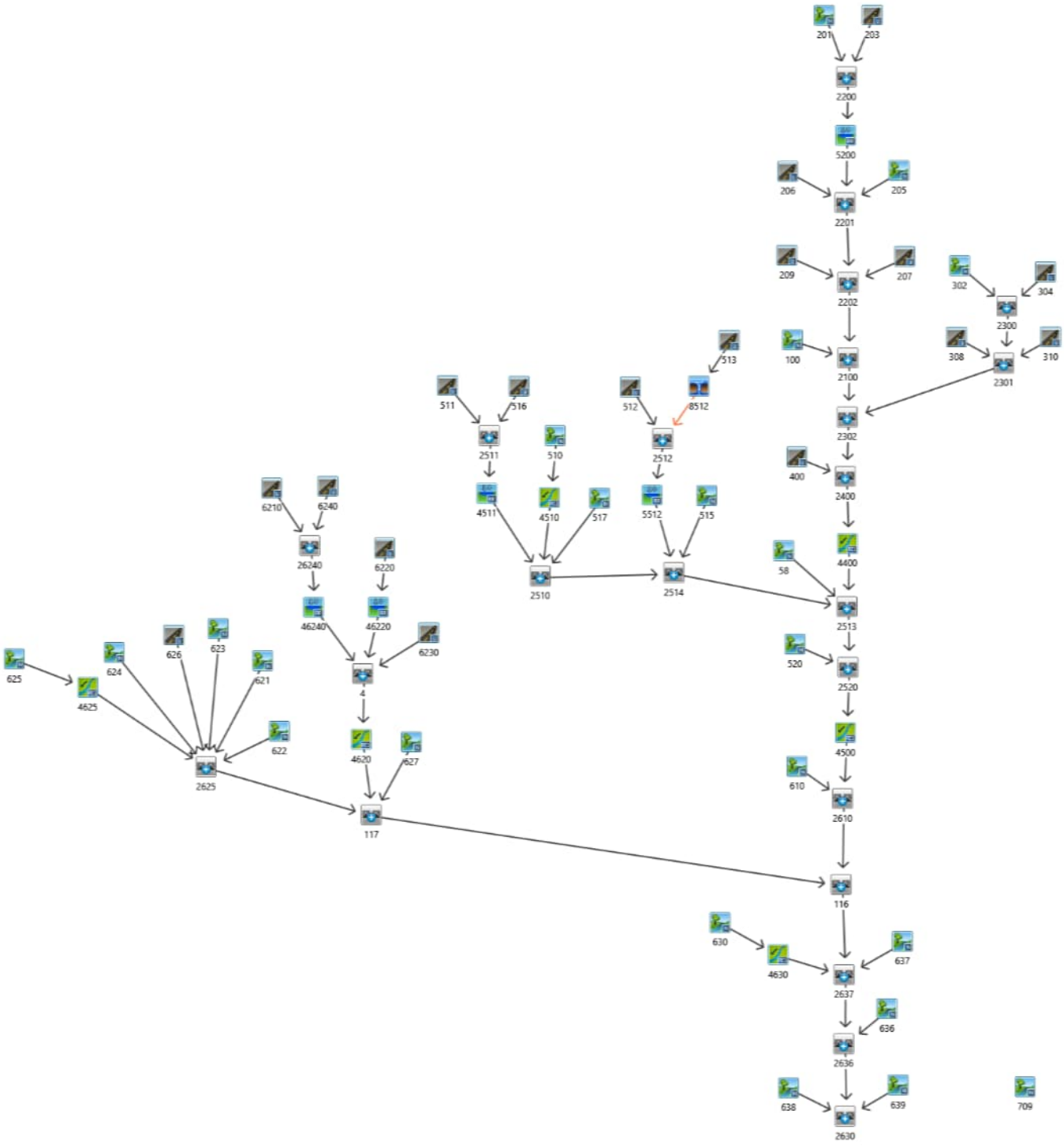
CALIB |				
NASHYD (0638)|	Area (ha)=	20.63	Curve Number (CN)=	85.0
ID= 1 DT= 5.0 min |	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.46		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00

```
               2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17   13.00
               2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
               2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33   13.00
               2.417    6.00 | 5.417   13.00 | 8.417   13.00 | 11.42   13.00
               2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
               2.583    6.00 | 5.583   13.00 | 8.583   13.00 | 11.58   13.00
               2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67   13.00
               2.750    6.00 | 5.750   13.00 | 8.750   13.00 | 11.75   13.00
               2.833    6.00 | 5.833   13.00 | 8.833   13.00 | 11.83   13.00
               2.917    6.00 | 5.917   13.00 | 8.917   13.00 | 11.92   13.00
               3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00   13.00

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   2.567 (i)
     TIME TO PEAK    (hrs)=  10.167
     RUNOFF VOLUME    (mm)= 170.143
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.803

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2636):   772.54  69.635    11.17   172.51
      + ID2= 2 (  0638):    20.63   2.567    10.17   170.14
        ================================================
        ID = 3 (  2630):   793.17  71.711    11.17   172.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2630):   793.17  71.711    11.17   172.45
      + ID2= 2 (  0639):     4.60   0.582    10.17   170.14
        ================================================
        ID = 1 (  2630):   797.77  72.167    11.17   172.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH
================================================================================
====================
```


201
203
2200
5200
206
205
2201
209
207
2202
302
304
2300
100
2100
308
310
2301
513
511
516
512
8512
2511
510
2512
2302
400
2400
6210
6240
4511
4510
517
5512
515
26240
6220
58
4400
2510
2514
46240
46220
6230
2513
625
624
626
623
621
520
2520
4625
4
4500
622
4620
627
610
2625
2610
117
116
630
637
4630
2637
636
2636
638
639
709
2630

```
--------------------------------------------------------------------------------
--------------------
  **********************************************
  ** SIMULATION : 2 year Fergus Shand Dam Chica **
  **********************************************

-------------------
| CHICAGO STORM    |    IDF curve parameters: A= 721.000
| Ptotal= 36.04 mm |                          B=   6.000
-------------------                          C=   0.796
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    2.15 |  1.00   10.02 |  2.00    6.24 |  3.00    2.89
               0.08    2.28 |  1.08   15.64 |  2.08    5.65 |  3.08    2.77
               0.17    2.44 |  1.17   36.22 |  2.17    5.18 |  3.17    2.67
               0.25    2.62 |  1.25  106.90 |  2.25    4.78 |  3.25    2.57
               0.33    2.83 |  1.33   46.53 |  2.33    4.44 |  3.33    2.48
               0.42    3.08 |  1.42   25.96 |  2.42    4.15 |  3.42    2.40
               0.50    3.39 |  1.50   17.80 |  2.50    3.90 |  3.50    2.32
               0.58    3.79 |  1.58   13.52 |  2.58    3.68 |  3.58    2.25
               0.67    4.29 |  1.67   10.91 |  2.67    3.49 |  3.67    2.18
               0.75    4.97 |  1.75    9.16 |  2.75    3.31 |  3.75    2.12
               0.83    5.94 |  1.83    7.91 |  2.83    3.16 |  3.83    2.06
               0.92    7.43 |  1.92    6.97 |  2.92    3.02 |  3.92    2.01


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   0.840 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=   6.637
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.184

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.153 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=   9.637
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.267

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69          4.51
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=       1.20          1.20
     Length            (m)=      25.00         25.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     106.90         21.28
               over (min)         5.00         15.00
     Storage Coeff.  (min)=       1.03 (ii)    12.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00         15.00
     Unit Hyd. peak  (cms)=       0.34          0.08
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.61          0.17          0.650 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04          9.66          15.76
     TOTAL RAINFALL   (mm)=      36.04         36.04          36.04
     RUNOFF COEFFICIENT   =       0.94          0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.153     2.58     9.64
     + ID2= 2 (  0203):     8.20   0.650     1.33    15.76
       ==========================================================
       ID = 3 (  2200):    22.80   0.655     1.33    11.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1980      0.2314
                          0.0040      0.0218   |    0.2920      0.2621
                          0.0060      0.0446   |    0.3980      0.2937
                          0.0070      0.0683   |    0.5150      0.3261
                          0.0080      0.0930   |    0.8290      0.3592
                          0.0090      0.1187   |    1.3520      0.3930
                          0.0230      0.1453   |    2.0570      0.4275
                          0.0610      0.1730   |    2.9590      0.4629
                          0.1200      0.2017   |    0.0000      0.0000
```

```
                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      0.655      1.33      11.84
   OUTFLOW: ID= 1 (  5200)     22.800      0.102      4.08      11.78

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.58
                  TIME SHIFT OF PEAK FLOW         (min)=165.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1930

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.190 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.006
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.527

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        21.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.03 (ii)   12.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.016 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.73
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
```

```
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0205):     4.80   0.190     1.83    19.01
      + ID2= 2 (  0206):     0.20   0.016     1.33    15.73
        ================================================
        ID = 3 (  2201):     5.00   0.195     1.83    18.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2201):     5.00   0.195     1.83    18.87
      + ID2= 2 (  5200):    22.80   0.102     4.08    11.78
        ================================================
        ID = 1 (  2201):    27.80   0.202     1.83    13.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        11.67
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       1.25 (ii)   19.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.33         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.04          0.070 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      34.04         7.85           9.94
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.22           0.28

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        21.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.03 (ii)   12.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.03          0.103 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66         15.75
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.94         0.27          0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.103     1.33    15.75
     + ID2= 2 (  0209):     2.70   0.070     1.33     9.94
       ================================================
       ID = 3 (  2202):     4.00   0.173     1.33    11.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.173     1.33    11.83
     + ID2= 2 (  2201):    27.80   0.202     1.83    13.05
       ================================================
       ID = 1 (  2202):    31.80   0.281     1.75    12.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   0.840     3.00     6.64
     + ID2= 2 (  2202):    31.80   0.281     1.75    12.90
       ================================================
       ID = 3 (  2100):   168.78   0.969     2.92     7.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.051 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   9.636
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.267

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        21.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.08 (ii)   13.25 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.09          0.347 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66         15.76
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.94         0.27          0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.051     1.92     9.64
     + ID2= 2 (  0304):     4.40   0.347     1.33    15.76
       ================================================
       ID = 3 (  2300):     7.30   0.354     1.33    13.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
```

```
| CALIB           |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        21.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.08 (ii)   13.25 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.016 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.72
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        13.48
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.03 (ii)   14.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.11          0.159 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      34.04         7.85           9.94
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.22           0.28

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.354     1.33    13.32
     + ID2= 2 (  0308):     0.20   0.016     1.33    15.72
       ================================================
       ID = 3 (  2301):     7.50   0.370     1.33    13.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.370     1.33    13.39
     + ID2= 2 (  0310):     5.70   0.159     1.33     9.94
       ================================================
       ID = 1 (  2301):    13.20   0.529     1.33    11.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   0.969     2.92     7.82
     + ID2= 2 (  2301):    13.20   0.529     1.33    11.90
       ================================================
       ID = 3 (  2302):   181.98   1.046     2.83     8.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB           |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      53.90        10.84
               over (min)        20.00        40.00
     Storage Coeff.  (min)=      18.02 (ii)   35.18 (ii)
     Unit Hyd. Tpeak (min)=      20.00        40.00
     Unit Hyd. peak  (cms)=       0.06         0.03
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.25         0.90          1.023 (iii)
     TIME TO PEAK    (hrs)=       1.58         2.08           2.00
     RUNOFF VOLUME    (mm)=      34.04         7.45           8.24
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.21           0.23
```

```
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2302):   181.98   1.046     2.83     8.11
      + ID2= 2 (  0400):    82.86   1.023     2.00     8.24
        ================================================
        ID = 3 (  2400):   264.84   1.942     2.08     8.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  0.00        411.10        0.0550
                 27.30        410.20        0.0550
                 77.50        409.10        0.0550
                 96.60        409.10        0.0550
                115.80        408.90        0.0550
                124.80        409.10        0.0550
                131.00        408.90    0.0550 /0.0350  Main Channel
                133.60        408.00        0.0350      Main Channel
                134.40        407.60        0.0350      Main Channel
                135.00        407.50        0.0350      Main Channel
                135.80        407.60        0.0350      Main Channel
                136.50        408.00        0.0350      Main Channel
                139.40        408.80    0.0350 /0.0550  Main Channel
                143.50        408.90        0.0550
                148.50        408.70        0.0550
                163.80        408.90        0.0550
                183.20        408.90        0.0550
                243.70        409.70        0.0550
                278.70        410.20        0.0550
                330.50        411.40        0.0550

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.19    407.69    .366E+03       0.1         0.51       58.83
       0.37    407.87    .106E+04       0.5         0.81       37.08
       0.56    408.06    .199E+04       1.1         1.00       29.93
       0.74    408.24    .328E+04       2.1         1.14       26.32
       0.93    408.43    .498E+04       3.6         1.28       23.32
       1.11    408.61    .708E+04       5.6         1.43       20.94
       1.30    408.80    .105E+05       8.5         1.45       20.61
       1.49    408.99    .247E+05      14.8         1.07       27.91
       1.68    409.18    .601E+05      30.4         0.91       32.97
       1.87    409.37    .109E+06      58.5         0.96       31.05
       2.06    409.56    .166E+06      98.3         1.06       28.11
       2.25    409.75    .231E+06     150.3         1.17       25.57
       2.44    409.94    .303E+06     215.4         1.28       23.46
       2.64    410.14    .383E+06     293.8         1.38       21.74
       2.83    410.33    .470E+06     390.1         1.49       20.10
       3.02    410.52    .563E+06     502.4         1.60       18.66
       3.21    410.71    .660E+06     628.8         1.71       17.48
       3.40    410.90    .762E+06     769.5         1.81       16.49
       3.59    411.09    .868E+06     924.9         1.91       15.65

                                  <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84     1.94    2.08   8.15      0.72      1.12
   OUTFLOW: ID= 1 (  4400)  264.84     1.71    2.69   8.08      0.67      1.08


      **** WARNING : THE HYD WAS CUT TO 2000 POINTS

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.067 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.963
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.193

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.09

     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   0.784 (i)
     TIME TO PEAK    (hrs)=   2.750
     RUNOFF VOLUME    (mm)=   8.627
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.239

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.206E+02	0.0	0.19	101.61
0.16	412.86	.822E+02	0.0	0.30	64.01
0.24	412.94	.185E+03	0.1	0.39	48.85
0.32	413.02	.329E+03	0.1	0.48	40.33
0.39	413.09	.514E+03	0.2	0.55	34.75
0.47	413.17	.740E+03	0.4	0.62	30.77
0.55	413.25	.101E+04	0.6	0.69	27.77
0.63	413.33	.132E+04	0.9	0.75	25.40
0.71	413.41	.166E+04	1.2	0.82	23.48
0.79	413.49	.206E+04	1.6	0.88	21.89
0.87	413.57	.249E+04	2.0	0.93	20.54
0.95	413.65	.296E+04	2.5	0.99	19.39
1.03	413.73	.347E+04	3.1	1.04	18.38
1.11	413.81	.403E+04	3.8	1.10	17.49
1.18	413.88	.462E+04	4.6	1.15	16.71
1.26	413.96	.526E+04	5.5	1.20	16.00
1.34	414.04	.594E+04	6.4	1.25	15.37
1.42	414.12	.666E+04	7.5	1.30	14.79
1.50	414.20	.742E+04	8.7	1.34	14.27

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<---- hydrograph ----> MAX DEPTH (m)	<-pipe / channel-> MAX VEL (m/s)
INFLOW : ID= 2	(0510)	91.44	0.78	2.75	8.63	0.61	0.73
OUTFLOW: ID= 1	(4510)	91.44	0.72	3.17	8.62	0.59	0.72

CALIB					
NASHYD	(0517)	Area (ha)=	2.14	Curve Number (CN)=	71.0
ID= 1 DT= 5.0 min		Ia (mm)=	1.50	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	0.32		

Unit Hyd Qpeak	(cms)=	0.255
PEAK FLOW	(cms)=	0.042 (i)
TIME TO PEAK	(hrs)=	1.750
RUNOFF VOLUME	(mm)=	8.624
TOTAL RAINFALL	(mm)=	36.039
RUNOFF COEFFICIENT	=	0.239

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD	(0511)	Area (ha)=	52.87		
ID= 1 DT= 5.0 min		Total Imp(%)=	50.00	Dir. Conn.(%)=	30.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	26.43	26.43
Dep. Storage	(mm)=	0.80	1.50
Average Slope	(%)=	1.00	1.00
Length	(m)=	593.69	40.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		76.72	25.83
over (min)		10.00	25.00
Storage Coeff. (min)=		8.27 (ii)	23.20 (ii)
Unit Hyd. Tpeak (min)=		10.00	25.00
Unit Hyd. peak (cms)=		0.13	0.05

				TOTALS
PEAK FLOW	(cms)=	2.57	0.87	2.863 (iii)
TIME TO PEAK	(hrs)=	1.42	1.75	1.42
RUNOFF VOLUME	(mm)=	35.24	11.21	18.42
TOTAL RAINFALL	(mm)=	36.04	36.04	36.04
RUNOFF COEFFICIENT	=	0.98	0.31	0.51

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD	(0516)	Area (ha)=	10.78		
ID= 1 DT= 5.0 min		Total Imp(%)=	45.00	Dir. Conn.(%)=	45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.85	5.93
Dep. Storage	(mm)=	0.80	1.50
Average Slope	(%)=	1.00	1.00
Length	(m)=	268.08	40.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		106.90	10.45
over (min)		5.00	30.00
Storage Coeff. (min)=		4.49 (ii)	25.94 (ii)
Unit Hyd. Tpeak (min)=		5.00	30.00
Unit Hyd. peak (cms)=		0.23	0.04

				TOTALS
PEAK FLOW	(cms)=	1.09	0.10	1.106 (iii)
TIME TO PEAK	(hrs)=	1.33	1.83	1.33
RUNOFF VOLUME	(mm)=	35.24	8.63	20.60
TOTAL RAINFALL	(mm)=	36.04	36.04	36.04
RUNOFF COEFFICIENT	=	0.98	0.24	0.57

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD	(2511)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 =	3	ID1= 1 (0511):	52.87	2.863	1.42	18.42
		+ ID2= 2 (0516):	10.78	1.106	1.33	20.60
		ID = 3 (2511):	63.65	3.669	1.42	18.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.7700      0.9000   |    3.2130      1.6220
                          1.6000      1.1400   |    3.9540      1.8810
                          2.2900      1.2810   |    4.9000      2.3000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650      3.669      1.42      18.79
   OUTFLOW: ID= 1 (  4511)     63.650      0.614      2.67      18.78

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.74
                  TIME SHIFT OF PEAK FLOW        (min)= 75.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7179

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   0.725     3.17     8.62
     + ID2= 2 (  4511):    63.65   0.614     2.67    18.78
       ================================================
       ID = 3 (  2510):   155.09   1.326     3.08    12.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   1.326     3.08    12.79
     + ID2= 2 (  0517):     2.14   0.042     1.75     8.62
       ================================================
       ID = 1 (  2510):   157.23   1.335     3.08    12.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        25.83
                 over (min)        5.00        20.00
     Storage Coeff.  (min)=       5.93 (ii)   18.06 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.19         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.63         0.52          1.747 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      35.24        11.21          18.42
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.98         0.31           0.51


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     207.20        40.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        42.42
                 over (min)        5.00        20.00
     Storage Coeff.  (min)=       3.85 (ii)   16.10 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.25         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.54         0.15          0.574 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      35.24        13.63          21.19
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.98         0.38           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      0.57      1.33   21.19
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   6.44      0.57      1.33   21.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
```

```
| ADD HYD  (  2512)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   1.747     1.33    18.42
     + ID2= 2 (  8512):     6.44   0.574     1.33    21.19
       ================================================
       ID = 3 (  2512):    33.57   2.321     1.33    18.95

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.6640      0.9151
                          0.0210      0.1601  |    0.8570      1.0220
                          0.0360      0.3317  |    1.0660      1.1320
                          0.0410      0.4218  |    1.2900      1.2450
                          0.1000      0.5147  |    1.5290      1.3610
                          0.2030      0.6105  |    1.7810      1.4800
                          0.3340      0.7092  |    2.0460      1.6020
                          0.4890      0.8107  |    2.3220      1.7260

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     33.570      2.321      1.33      18.95
   OUTFLOW: ID= 1 (  5512)     33.570      0.129      4.00      18.89

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.54
                  TIME SHIFT OF PEAK FLOW         (min)=160.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5414

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   1.335     3.08    12.73
     + ID2= 2 (  0515):     5.01   0.067     1.83     6.96
       ================================================
       ID = 3 (  2514):   162.24   1.356     3.08    12.56

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   1.356     3.08    12.56
     + ID2= 2 (  5512):    33.57   0.129     4.00    18.89
       ================================================
       ID = 1 (  2514):   195.81   1.466     3.08    13.64

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0058)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

    Unit Hyd Qpeak  (cms)=   1.276

    PEAK FLOW       (cms)=   0.134 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=   7.134
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.198

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2514):   195.81   1.466     3.08    13.64
     + ID2= 2 (  4400):   264.84   1.706     2.69     8.08
       ================================================
       ID = 3 (  2513):   460.65   3.134     2.92    10.33

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   460.65   3.134     2.92    10.33
     + ID2= 2 (  0058):     6.68   0.134     1.58     7.13
       ================================================
       ID = 1 (  2513):   467.33   3.160     2.89    10.29

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

    Unit Hyd Qpeak  (cms)=   3.449

    PEAK FLOW       (cms)=   0.706 (i)
    TIME TO PEAK    (hrs)=   3.000
    RUNOFF VOLUME    (mm)=   7.148
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.198

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   467.33   3.160     2.89    10.29
     + ID2= 2 (  0520):   108.36   0.706     3.00     7.15
       ================================================
       ID = 3 (  2520):   575.69   3.864     2.92     9.70
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4500)
IN= 2---> OUT= 1

Routing time step (min)'= 2.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	409.70	0.0550	
19.70	408.80	0.0550	
41.70	407.20	0.0550	
60.50	405.30	0.0550	
80.00	404.50	0.0550	
95.70	404.60	0.0550 /0.0350	Main Channel
98.60	403.40	0.0350	Main Channel
100.40	403.40	0.0350	Main Channel
100.80	402.90	0.0350	Main Channel
101.50	402.70	0.0350	Main Channel
102.30	402.80	0.0350	Main Channel
103.30	403.20	0.0350	Main Channel
104.00	403.20	0.0350	Main Channel
105.60	404.40	0.0350 /0.0550	Main Channel
109.70	404.30	0.0550	
128.60	404.20	0.0550	
154.10	405.40	0.0550	
179.10	406.70	0.0550	
201.90	408.60	0.0550	
224.20	410.60	0.0550	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.34	403.04	.954E+03	0.3	0.70	47.40
0.68	403.38	.304E+04	1.6	1.03	32.27
1.02	403.72	.718E+04	4.5	1.25	26.57
1.36	404.06	.122E+05	9.7	1.58	20.96
1.70	404.40	.251E+05	18.1	1.44	23.04
2.08	404.78	.650E+05	42.3	1.29	25.62
2.46	405.16	.122E+06	86.3	1.40	23.62
2.84	405.54	.192E+06	151.6	1.57	21.10
3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85
4.35	407.05	.554E+06	631.1	2.26	14.63
4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (2520)	575.69	3.86	2.92	9.70	0.95	1.19
OUTFLOW:	ID= 1 (4500)	575.69	3.64	3.39	9.69	0.92	1.17

CALIB

NASHYD (0610)	Area (ha)= 78.05 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.00

Unit Hyd Qpeak (cms)= 2.981

PEAK FLOW (cms)= 0.575 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 7.148
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.198

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2610)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (4500):	575.69	3.640	3.39	9.69
	+ ID2= 2 (0610):	78.05	0.575	2.75	7.15
	ID = 3 (2610):	653.74	4.137	3.28	9.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0621)| Area (ha)= 6.56 Curve Number (CN)= 70.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.37

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.089 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 6.885
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0622)| Area (ha)= 9.69 Curve Number (CN)= 70.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.36

Unit Hyd Qpeak (cms)= 1.028

PEAK FLOW (cms)= 0.133 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 6.885
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

```
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   0.231 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.131 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.088 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0360      Main Channel
                   4.30        412.70        0.0360      Main Channel
                   8.60        414.20        0.0360      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .108E+02       0.0          0.24      42.13
        0.16   412.86    .434E+02       0.0          0.38      26.54
        0.24   412.94    .976E+02       0.1          0.50      20.26
        0.32   413.02    .174E+03       0.2          0.61      16.72
        0.39   413.09    .271E+03       0.3          0.70      14.41
        0.47   413.17    .390E+03       0.5          0.79      12.76
        0.55   413.25    .532E+03       0.8          0.88      11.51
        0.63   413.33    .694E+03       1.1          0.96      10.53
        0.71   413.41    .879E+03       1.5          1.04       9.74
        0.79   413.49    .108E+04       2.0          1.11       9.08
        0.87   413.57    .131E+04       2.6          1.19       8.52
        0.95   413.65    .156E+04       3.2          1.26       8.04
        1.03   413.73    .183E+04       4.0          1.33       7.62
        1.11   413.81    .213E+04       4.9          1.39       7.25
        1.18   413.88    .244E+04       5.9          1.46       6.93
        1.26   413.96    .278E+04       7.0          1.52       6.64
        1.34   414.04    .313E+04       8.2          1.59       6.37
        1.42   414.12    .351E+04       9.5          1.65       6.13
        1.50   414.20    .392E+04      11.0          1.71       5.92

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0625)    6.72     0.09    1.83   6.89      0.24      0.51
   OUTFLOW: ID= 1 (  4625)    6.72     0.07    2.17   6.85      0.22      0.47


--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.64          0.42
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      84.06         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     106.90         20.27
               over (min)         5.00         20.00
     Storage Coeff.  (min)=       2.24 (ii)   15.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00         20.00
     Unit Hyd. peak  (cms)=       0.30          0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.15          0.01          0.149 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.67           1.33
     RUNOFF VOLUME    (mm)=      35.04          9.96          22.49
     TOTAL RAINFALL   (mm)=      36.04         36.04          36.04
     RUNOFF COEFFICIENT   =       0.97          0.28           0.62

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
```

```
| ADD HYD  (  2625)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.071     2.17     6.85
     + ID2= 2 (  0621):     6.56   0.089     1.83     6.89
       ================================================
       ID = 3 (  2625):    13.28   0.149     2.00     6.87

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    13.28   0.149     2.00     6.87
     + ID2= 2 (  0622):     9.69   0.133     1.83     6.89
       ================================================
       ID = 1 (  2625):    22.97   0.276     1.92     6.88

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    22.97   0.276     1.92     6.88
     + ID2= 2 (  0623):    19.37   0.231     1.92     6.89
       ================================================
       ID = 3 (  2625):    42.34   0.507     1.92     6.88

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    42.34   0.507     1.92     6.88
     + ID2= 2 (  0624):    11.84   0.131     2.00     6.89
       ================================================
       ID = 1 (  2625):    54.18   0.635     1.92     6.88

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    54.18   0.635     1.92     6.88
     + ID2= 2 (  0626):     1.06   0.149     1.33    22.49
       ================================================
       ID = 3 (  2625):    55.24   0.657     1.92     7.18

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

    Unit Hyd Qpeak  (cms)=   1.793

    PEAK FLOW       (cms)=   0.181 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=   6.874
    TOTAL RAINFALL   (mm)=  36.039
    RUNOFF COEFFICIENT   =   0.191

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=        0.71         0.08
    Dep. Storage     (mm)=        0.52         7.16
    Average Slope     (%)=        2.00         2.00
    Length            (m)=       20.00        20.00
    Mannings n           =       0.013        0.250

    Max.Eff.Inten.(mm/hr)=      106.90       115.77
              over (min)         5.00         5.00
    Storage Coeff.  (min)=        0.77 (ii)    2.85 (ii)
    Unit Hyd. Tpeak (min)=        5.00         5.00
    Unit Hyd. peak  (cms)=        0.34         0.28
                                                          *TOTALS*
    PEAK FLOW       (cms)=        0.16         0.03          0.192 (iii)
    TIME TO PEAK    (hrs)=        1.33         1.33           1.33
    RUNOFF VOLUME    (mm)=       35.52        17.86          30.22
    TOTAL RAINFALL   (mm)=       36.04        36.04          36.04
    RUNOFF COEFFICIENT   =        0.99         0.50           0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=        1.18         0.78
    Dep. Storage     (mm)=        0.52         7.16
    Average Slope     (%)=        2.00         2.00
    Length            (m)=       40.00        40.00
    Mannings n           =       0.013        0.250

    Max.Eff.Inten.(mm/hr)=      106.90        26.23
              over (min)         5.00        15.00
    Storage Coeff.  (min)=        1.17 (ii)   13.22 (ii)
    Unit Hyd. Tpeak (min)=        5.00        15.00
    Unit Hyd. peak  (cms)=        0.34         0.08
                                                          *TOTALS*
```

```
     PEAK FLOW      (cms)=       0.23         0.04          0.239 (iii)
     TIME TO PEAK   (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME   (mm)=      35.52        10.77          20.67
     TOTAL RAINFALL  (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT  =       0.99         0.30           0.57

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.239     1.33    20.67
     + ID2= 2 (  6240):     0.79   0.192     1.33    30.22
       ================================================
       ID = 3 ( 26240):     2.75   0.431     1.33    23.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000      0.0000   |    0.1390      0.0686
                         0.0060      0.0042   |    0.1510      0.0822
                         0.0130      0.0130   |    0.1630      0.0967
                         0.0200      0.0250   |    0.1730      0.1121
                         0.0250      0.0328   |    0.1780      0.1202
                         0.0290      0.0439   |    2.5750      0.1742
                         0.1260      0.0558   |    0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)     2.750      0.431      1.33      23.41
   OUTFLOW: ID= 1 ( 46240)     2.750      0.028      2.50      23.35

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.55
                 TIME SHIFT OF PEAK FLOW         (min)= 70.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.0417

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        20.42
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.17 (ii)   14.49 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.02          0.058 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      35.52         9.64          14.80
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.99         0.27           0.41

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000      0.0000   |    0.2590      0.0708
                         0.0050      0.0089   |    0.2910      0.0871
                         0.0100      0.0187   |    0.3210      0.1045
                         0.0130      0.0298   |    0.3720      0.1438
                         0.0150      0.0422   |    2.8080      0.2087
                         0.2220      0.0559   |    0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)     0.920      0.058      1.33      14.80
   OUTFLOW: ID= 1 ( 46220)     0.920      0.005      3.08      14.32

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.86
                 TIME SHIFT OF PEAK FLOW         (min)=105.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.0092

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05         0.43
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        11.91
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       0.77 (ii)   11.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.010 (iii)
```

```
     TIME TO PEAK    (hrs)=       1.33         1.58          1.58
     RUNOFF VOLUME    (mm)=      35.52         7.52          8.91
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.99         0.21          0.25

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.005     3.08    14.32
     + ID2= 2 ( 46240):     2.75   0.028     2.50    23.35
       ================================================
       ID = 3 (  0004):     3.67   0.033     2.58    21.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):     3.67   0.033     2.58    21.09
     + ID2= 2 (  6230):     0.48   0.010     1.58     8.91
       ================================================
       ID = 1 (  0004):     4.15   0.039     1.67    19.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         414.20        0.0350      Main Channel
                  4.30         412.70        0.0350      Main Channel
                  8.60         414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55       7.70
       0.16   412.86    .182E+02       0.1          0.88       4.85
       0.24   412.94    .410E+02       0.2          1.15       3.70
       0.32   413.02    .729E+02       0.4          1.39       3.05
       0.39   413.09    .114E+03       0.7          1.61       2.63
       0.47   413.17    .164E+03       1.2          1.82       2.33
       0.55   413.25    .223E+03       1.8          2.02       2.10
       0.63   413.33    .292E+03       2.5          2.21       1.92
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0004)     4.15     0.04    1.67   19.68      0.12      0.69
  OUTFLOW: ID= 1 (  4620)     4.15     0.04    1.83   19.52      0.12      0.69

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0117)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):     55.24   0.657     1.92     7.18
     + ID2= 2 (  4620):      4.15   0.039     1.83    19.52
       ================================================
       ID = 3 (  0117):     59.39   0.695     1.92     8.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0117)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0117):     59.39   0.695     1.92     8.04
     + ID2= 2 (  0627):      9.39   0.181     1.58     6.87
       ================================================
       ID = 1 (  0117):     68.78   0.812     1.83     7.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0116)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0117):     68.78   0.812     1.83     7.88
     + ID2= 2 (  2610):    653.74   4.137     3.28     9.39
       ================================================
       ID = 3 (  0116):    722.52   4.437     3.22     9.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679
```

```
     PEAK FLOW      (cms)=   0.097 (i)
     TIME TO PEAK   (hrs)=   2.000
     RUNOFF VOLUME   (mm)=   6.886
     TOTAL RAINFALL  (mm)=  36.039
     RUNOFF COEFFICIENT  =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD  (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW      (cms)=   0.439 (i)
     TIME TO PEAK   (hrs)=   1.833
     RUNOFF VOLUME   (mm)=   6.886
     TOTAL RAINFALL  (mm)=  36.039
     RUNOFF COEFFICIENT  =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17      47.72
       0.16   412.86    .357E+02       0.0          0.28      30.06
       0.24   412.94    .804E+02       0.1          0.36      22.94
       0.32   413.02    .143E+03       0.1          0.44      18.94
       0.39   413.09    .223E+03       0.2          0.51      16.32
       0.47   413.17    .322E+03       0.4          0.58      14.45
       0.55   413.25    .438E+03       0.6          0.64      13.04
       0.63   413.33    .572E+03       0.8          0.70      11.93
       0.71   413.41    .724E+03       1.1          0.76      11.03
       0.79   413.49    .893E+03       1.4          0.81      10.28
       0.87   413.57    .108E+04       1.9          0.86       9.65
       0.95   413.65    .129E+04       2.4          0.92       9.10
       1.03   413.73    .151E+04       2.9          0.97       8.63
       1.11   413.81    .175E+04       3.6          1.01       8.22
       1.18   413.88    .201E+04       4.3          1.06       7.85
       1.26   413.96    .229E+04       5.1          1.11       7.52
       1.34   414.04    .258E+04       6.0          1.15       7.22
       1.42   414.12    .289E+04       6.9          1.20       6.95
       1.50   414.20    .323E+04       8.0          1.24       6.70

                                <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     0.44    1.83   6.89      0.50      0.60
   OUTFLOW: ID= 1 (  4630)   33.04     0.38    2.08   6.88      0.48      0.58

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0116):   722.52   4.437     3.22     9.24
     + ID2= 2 (  4630):    33.04   0.384     2.08     6.88
       ==========================================================
       ID = 3 (  2637):   755.56   4.595     3.14     9.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   755.56   4.595     3.14     9.14
     + ID2= 2 (  0637):     8.36   0.097     2.00     6.89
       ==========================================================
       ID = 1 (  2637):   763.92   4.634     3.14     9.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD  (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW      (cms)=   0.038 (i)
     TIME TO PEAK   (hrs)=   2.000
     RUNOFF VOLUME   (mm)=   6.886
     TOTAL RAINFALL  (mm)=  36.039
     RUNOFF COEFFICIENT  =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   763.92   4.634     3.14     9.12
     + ID2= 2 (  0636):     3.32   0.038     2.00     6.89
       ==========================================================
       ID = 3 (  2636):   767.24   4.650     3.14     9.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD  (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.46
```

```
     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   0.243 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.057 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   767.24   4.650     3.14     9.11
     + ID2= 2 (  0638):    20.63   0.243     1.92     6.89
       ================================================
       ID = 3 (  2630):   787.87   4.746     3.11     9.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   787.87   4.746     3.11     9.05
     + ID2= 2 (  0639):     4.60   0.057     1.92     6.89
       ================================================
       ID = 1 (  2630):   792.47   4.767     3.08     9.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0709)|   Area    (ha)=  21.19   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.65

     Unit Hyd Qpeak  (cms)=   1.245

     PEAK FLOW       (cms)=   0.200 (i)
     TIME TO PEAK    (hrs)=   2.250
     RUNOFF VOLUME    (mm)=   6.887
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

 FINISH
================================================================================
====================
--------------------------------------------------------------------------------
-------------------
  ***********************************************
  ** SIMULATION : 5 year Fergus Shand Dam Chica **
  ***********************************************

-------------------
| CHICAGO STORM    |    IDF curve parameters: A=1436.000
| Ptotal= 51.35 mm |                          B=  11.000
-------------------                          C=   0.854
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.55 |  1.00   15.63 |  2.00    9.04 |  3.00    3.62
                0.08    2.73 |  1.08   25.44 |  2.08    8.05 |  3.08    3.45
                0.17    2.95 |  1.17   57.17 |  2.17    7.25 |  3.17    3.29
                0.25    3.21 |  1.25  134.65 |  2.25    6.59 |  3.25    3.15
                0.33    3.53 |  1.33   71.87 |  2.33    6.04 |  3.33    3.02
                0.42    3.91 |  1.42   42.53 |  2.42    5.57 |  3.42    2.90
                0.50    4.38 |  1.50   29.16 |  2.50    5.17 |  3.50    2.79
                0.58    4.99 |  1.58   21.78 |  2.58    4.83 |  3.58    2.69
                0.67    5.80 |  1.67   17.20 |  2.67    4.52 |  3.67    2.59
                0.75    6.91 |  1.75   14.12 |  2.75    4.26 |  3.75    2.51
                0.83    8.53 |  1.83   11.92 |  2.83    4.02 |  3.83    2.42
                0.92   11.09 |  1.92   10.29 |  2.92    3.81 |  3.92    2.35


-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   1.783 (i)
     TIME TO PEAK    (hrs)=   2.917
     RUNOFF VOLUME    (mm)=  13.390
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.261

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
-------------------
| CALIB           |
```

```
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.296 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  17.868
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.348

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.69        4.51
     Dep. Storage     (mm)=      2.00        5.00
     Average Slope     (%)=      1.20        1.20
     Length            (m)=     25.00       25.00
     Mannings n           =     0.013       0.250

     Max.Eff.Inten.(mm/hr)=    134.65       48.29
               over (min)        5.00       10.00
     Storage Coeff.  (min)=      0.93 (ii)   9.24 (ii)
     Unit Hyd. Tpeak (min)=      5.00       10.00
     Unit Hyd. peak  (cms)=      0.34        0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.76        0.40        0.950 (iii)
     TIME TO PEAK    (hrs)=      1.33        1.50         1.33
     RUNOFF VOLUME    (mm)=     49.35       18.37        26.12
     TOTAL RAINFALL   (mm)=     51.35       51.35        51.35
     RUNOFF COEFFICIENT   =      0.96        0.36         0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):    14.60   0.296     2.58    17.87
      + ID2= 2 (  0203):     8.20   0.950     1.33    26.12
        ================================================
        ID = 3 (  2200):    22.80   0.962     1.33    20.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
```

```
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.1980      0.2314
                          0.0040      0.0218  |    0.2920      0.2621
                          0.0060      0.0446  |    0.3980      0.2937
                          0.0070      0.0683  |    0.5150      0.3261
                          0.0080      0.0930  |    0.8290      0.3592
                          0.0090      0.1187  |    1.3520      0.3930
                          0.0230      0.1453  |    2.0570      0.4275
                          0.0610      0.1730  |    2.9590      0.4629
                          0.1200      0.2017  |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      0.962      1.33      20.84
   OUTFLOW: ID= 1 (  5200)     22.800      0.276      3.42      20.77

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 28.67
                  TIME SHIFT OF PEAK FLOW         (min)=125.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2568

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.335 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  31.830
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.620

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.09        0.11
     Dep. Storage     (mm)=      2.00        5.00
     Average Slope     (%)=      1.20        1.20
     Length            (m)=     25.00       25.00
     Mannings n           =     0.013       0.250

     Max.Eff.Inten.(mm/hr)=    134.65       48.29
               over (min)        5.00       10.00
     Storage Coeff.  (min)=      0.93 (ii)   9.24 (ii)
     Unit Hyd. Tpeak (min)=      5.00       10.00
     Unit Hyd. peak  (cms)=      0.34        0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.02        0.01         0.023 (iii)
     TIME TO PEAK    (hrs)=      1.33        1.50         1.33
     RUNOFF VOLUME    (mm)=     49.35       18.37        26.10
     TOTAL RAINFALL   (mm)=     51.35       51.35        51.35
     RUNOFF COEFFICIENT   =      0.96        0.36         0.51
```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2201)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		4.80	0.335	1.83	31.83
+ ID2= 2 (0206):		0.20	0.023	1.33	26.10
ID = 3 (2201):		5.00	0.342	1.83	31.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2201)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (2201):		5.00	0.342	1.83	31.60
+ ID2= 2 (5200):		22.80	0.276	3.42	20.77
ID = 1 (2201):		27.80	0.379	1.92	22.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0209)		Area	(ha)=	2.70	
ID= 1 DT= 5.0 min		Total Imp(%)=	16.00	Dir. Conn.(%)=	8.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.43	2.27	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	1.20	1.20	
Length	(m)=	35.00	35.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		134.65	27.37	
over (min)		5.00	15.00	
Storage Coeff. (min)=		1.14 (ii)	13.89 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.34	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.08	0.11	0.126 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.58
RUNOFF VOLUME	(mm)=	49.35	15.47	18.18
TOTAL RAINFALL	(mm)=	51.35	51.35	51.35
RUNOFF COEFFICIENT	=	0.96	0.30	0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0207)		Area	(ha)=	1.30	
ID= 1 DT= 5.0 min		Total Imp(%)=	45.00	Dir. Conn.(%)=	25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.58	0.72	
Dep. Storage	(mm)=	2.00	5.00	
Average Slope	(%)=	1.20	1.20	
Length	(m)=	25.00	25.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		134.65	48.29	
over (min)		5.00	10.00	
Storage Coeff. (min)=		0.93 (ii)	9.24 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.34	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.12	0.06	0.151 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	49.35	18.37	26.11
TOTAL RAINFALL	(mm)=	51.35	51.35	51.35
RUNOFF COEFFICIENT	=	0.96	0.36	0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2202)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0207):		1.30	0.151	1.33	26.11
+ ID2= 2 (0209):		2.70	0.126	1.58	18.18
ID = 3 (2202):		4.00	0.258	1.33	20.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2202)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (2202):		4.00	0.258	1.33	20.76
+ ID2= 2 (2201):		27.80	0.379	1.92	22.72
ID = 1 (2202):		31.80	0.519	1.75	22.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   1.783     2.92    13.39
     + ID2= 2 (  2202):    31.80   0.519     1.75    22.47
       ================================================
       ID = 3 (  2100):   168.78   2.159     2.83    15.10

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.100 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  17.867
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.348

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        48.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.99 (ii)    9.76 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.41         0.21          0.506 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.12
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
```

```
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.100     1.92    17.87
     + ID2= 2 (  0304):     4.40   0.506     1.33    26.12
       ================================================
       ID = 3 (  2300):     7.30   0.520     1.33    22.84

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        48.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.99 (ii)    9.76 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.023 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.09
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        31.72
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       0.93 (ii)   10.76 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.25          0.292 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.50
```

```
     RUNOFF VOLUME    (mm)=      49.35        15.47          18.18
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.30           0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.520     1.33    22.84
     + ID2= 2 (  0308):     0.20   0.023     1.33    26.09
       ================================================
       ID = 3 (  2301):     7.50   0.543     1.33    22.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.543     1.33    22.93
     + ID2= 2 (  0310):     5.70   0.292     1.50    18.18
       ================================================
       ID = 1 (  2301):    13.20   0.781     1.33    20.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   2.159     2.83    15.10
     + ID2= 2 (  2301):    13.20   0.781     1.33    20.88
       ================================================
       ID = 3 (  2302):   181.98   2.289     2.75    15.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.90        25.58
               over (min)        15.00        30.00
     Storage Coeff.  (min)=      14.81 (ii)   26.99 (ii)
     Unit Hyd. Tpeak (min)=      15.00        30.00
     Unit Hyd. peak  (cms)=       0.08         0.04
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.40         2.26          2.496 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.92           1.83
     RUNOFF VOLUME    (mm)=      49.35        14.77          15.81
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.29           0.31

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   2.289     2.75    15.52
     + ID2= 2 (  0400):    82.86   2.496     1.83    15.81
       ================================================
       ID = 3 (  2400):   264.84   4.237     1.92    15.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        411.10        0.0550
                  27.30        410.20        0.0550
                  77.50        409.10        0.0550
                  96.60        409.10        0.0550
                 115.80        408.90        0.0550
                 124.80        409.10        0.0550
                 131.00        408.90    0.0550 /0.0350  Main Channel
                 133.60        408.00        0.0350      Main Channel
                 134.40        407.60        0.0350      Main Channel
                 135.00        407.50        0.0350      Main Channel
                 135.80        407.60        0.0350      Main Channel
                 136.50        408.00        0.0350      Main Channel
                 139.40        408.80    0.0350 /0.0550  Main Channel
                 143.50        408.90        0.0550
                 148.50        408.70        0.0550
                 163.80        408.90        0.0550
                 183.20        408.90        0.0550
                 243.70        409.70        0.0550
                 278.70        410.20        0.0550
                 330.50        411.40        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
```

(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.19	407.69	.366E+03	0.1	0.51	58.83
0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66
3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2400)	264.84	4.24	1.92	15.61	0.99	1.33
OUTFLOW: ID= 1 (4400)	264.84	3.71	2.44	15.54	0.94	1.29

**** WARNING : THE HYD WAS CUT TO 2000 POINTS

CALIB					
NASHYD (0515)	Area (ha)=	5.01	Curve Number (CN)=	65.0	
ID= 1 DT= 5.0 min	Ia (mm)=	1.50	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.41			

Unit Hyd Qpeak (cms)= 0.467

PEAK FLOW (cms)= 0.135 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 13.316
TOTAL RAINFALL (mm)= 51.355
RUNOFF COEFFICIENT = 0.259

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0510)	Area (ha)=	91.44	Curve Number (CN)=	71.0	
ID= 1 DT= 5.0 min	Ia (mm)=	1.50	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	1.09			

Unit Hyd Qpeak (cms)= 3.204

PEAK FLOW (cms)= 1.537 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 16.181
TOTAL RAINFALL (mm)= 51.355
RUNOFF COEFFICIENT = 0.315

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4510)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.206E+02	0.0	0.19	101.61
0.16	412.86	.822E+02	0.0	0.30	64.01
0.24	412.94	.185E+03	0.1	0.39	48.85
0.32	413.02	.329E+03	0.1	0.48	40.33
0.39	413.09	.514E+03	0.2	0.55	34.75
0.47	413.17	.740E+03	0.4	0.62	30.77
0.55	413.25	.101E+04	0.6	0.69	27.77
0.63	413.33	.132E+04	0.9	0.75	25.40
0.71	413.41	.166E+04	1.2	0.82	23.48
0.79	413.49	.206E+04	1.6	0.88	21.89
0.87	413.57	.249E+04	2.0	0.93	20.54
0.95	413.65	.296E+04	2.5	0.99	19.39
1.03	413.73	.347E+04	3.1	1.04	18.38
1.11	413.81	.403E+04	3.8	1.10	17.49
1.18	413.88	.462E+04	4.6	1.15	16.71
1.26	413.96	.526E+04	5.5	1.20	16.00
1.34	414.04	.594E+04	6.4	1.25	15.37
1.42	414.12	.666E+04	7.5	1.30	14.79
1.50	414.20	.742E+04	8.7	1.34	14.27

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0510)	91.44	1.54	2.75	16.18	0.78	0.87
OUTFLOW: ID= 1 (4510)	91.44	1.44	3.08	16.18	0.76	0.86

CALIB					
NASHYD (0517)	Area (ha)=	2.14	Curve Number (CN)=	71.0	
ID= 1 DT= 5.0 min	Ia (mm)=	1.50	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.32			

Unit Hyd Qpeak (cms)= 0.255

PEAK FLOW (cms)= 0.082 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 16.176
TOTAL RAINFALL (mm)= 51.355
RUNOFF COEFFICIENT = 0.315

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

```
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43        26.43
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     593.69        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        47.10
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       6.60 (ii)   18.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.18         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       3.97         1.90          4.399 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      50.55        20.33          29.39
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.40           0.57


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        26.22
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       4.10 (ii)   18.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.24         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.46         0.23          1.514 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      50.55        16.18          31.65
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.32           0.62

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   4.399     1.33    29.39
     + ID2= 2 (  0516):    10.78   1.514     1.33    31.65
       ==========================================================
       ID = 3 (  2511):    63.65   5.914     1.33    29.78

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.7700      0.9000   |    3.2130      1.6220
                          1.6000      1.1400   |    3.9540      1.8810
                          2.2900      1.2810   |    4.9000      2.3000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
  INFLOW : ID= 2 (  2511)     63.650      5.914      1.33      29.78
  OUTFLOW: ID= 1 (  4511)     63.650      1.450      2.25      29.77

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 24.52
                TIME SHIFT OF PEAK FLOW         (min)= 55.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.0976

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   1.444     3.08    16.18
     + ID2= 2 (  4511):    63.65   1.450     2.25    29.77
       ==========================================================
       ID = 3 (  2510):   155.09   2.645     2.75    21.76

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   2.645     2.75    21.76
     + ID2= 2 (  0517):     2.14   0.082     1.75    16.18
       ==========================================================
       ID = 1 (  2510):   157.23   2.667     2.75    21.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
```

```
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        55.63
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       5.41 (ii)   14.33 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.21         0.08
                                                    *TOTALS*
     PEAK FLOW       (cms)=       2.22         1.12          2.578 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      50.55        20.33          29.39
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.40           0.57


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     207.20        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        89.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.51 (ii)   12.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.08
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.71         0.31          0.822 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      50.55        24.01          33.30
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.47           0.65

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      0.82      1.33   33.30
     ================================================
     MAJOR SYS.(ID= 2):   0.08      0.09      1.33   33.30
     MINOR SYS.(ID= 3):   6.36      0.73      1.33   33.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   2.578     1.33    29.39
     + ID2= 2 (  8512):     6.36   0.732     1.33    33.30
       ================================================
       ID = 3 (  2512):    33.49   3.310     1.33    30.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.6640      0.9151
                           0.0210      0.1601   |    0.8570      1.0220
                           0.0360      0.3317   |    1.0660      1.1320
                           0.0410      0.4218   |    1.2900      1.2450
                           0.1000      0.5147   |    1.5290      1.3610
                           0.2030      0.6105   |    1.7810      1.4800
                           0.3340      0.7092   |    2.0460      1.6020
                           0.4890      0.8107   |    2.3220      1.7260

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     33.489     3.310      1.33      30.14
   OUTFLOW: ID= 1 (  5512)     33.489     0.395      2.75      30.08

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.92
                  TIME SHIFT OF PEAK FLOW         (min)= 85.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7490

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   2.667     2.75    21.68
     + ID2= 2 (  0515):     5.01   0.135     1.83    13.32
       ================================================
       ID = 3 (  2514):   162.24   2.725     2.67    21.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   2.725     2.67    21.42
```

```
      + ID2= 2 (  5512):    33.49   0.395     2.75    30.08
        ================================================
        ID = 1 (  2514):   195.73   3.119     2.67    22.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0058)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.288 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  14.288
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.278

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2514):   195.73   3.119     2.67    22.90
      + ID2= 2 (  4400):   264.84   3.709     2.44    15.54
        ================================================
        ID = 3 (  2513):   460.57   6.789     2.58    18.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2513):   460.57   6.789     2.58    18.54
      + ID2= 2 (  0058):     6.68   0.288     1.58    14.29
        ================================================
        ID = 1 (  2513):   467.25   6.848     2.58    18.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.20

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   1.486 (i)
     TIME TO PEAK    (hrs)=   2.917
     RUNOFF VOLUME    (mm)=  14.315
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.279

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2513):   467.25   6.848     2.58    18.48
      + ID2= 2 (  0520):   108.36   1.486     2.92    14.32
        ================================================
        ID = 3 (  2520):   575.61   8.267     2.67    17.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------

              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         409.70        0.0550
                 19.70         408.80        0.0550
                 41.70         407.20        0.0550
                 60.50         405.30        0.0550
                 80.00         404.50        0.0550
                 95.70         404.60    0.0550 /0.0350  Main Channel
                 98.60         403.40        0.0350      Main Channel
                100.40         403.40        0.0350      Main Channel
                100.80         402.90        0.0350      Main Channel
                101.50         402.70        0.0350      Main Channel
                102.30         402.80        0.0350      Main Channel
                103.30         403.20        0.0350      Main Channel
                104.00         403.20        0.0350      Main Channel
                105.60         404.40    0.0350 /0.0550  Main Channel
                109.70         404.30        0.0550
                128.60         404.20        0.0550
                154.10         405.40        0.0550
                179.10         406.70        0.0550
                201.90         408.60        0.0550
                224.20         410.60        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.34    403.04    .954E+03       0.3          0.70      47.40
      0.68    403.38    .304E+04       1.6          1.03      32.27
      1.02    403.72    .718E+04       4.5          1.25      26.57
      1.36    404.06    .122E+05       9.7          1.58      20.96
      1.70    404.40    .251E+05      18.1          1.44      23.04
      2.08    404.78    .650E+05      42.3          1.29      25.62
      2.46    405.16    .122E+06      86.3          1.40      23.62
      2.84    405.54    .192E+06     151.6          1.57      21.10
      3.21    405.91    .270E+06     238.3          1.75      18.90
      3.59    406.29    .357E+06     345.8          1.93      17.20
      3.97    406.67    .452E+06     474.9          2.09      15.85
      4.35    407.05    .554E+06     631.1          2.26      14.63
      4.73    407.43    .663E+06     807.8          2.42      13.67
      5.11    407.81    .779E+06    1006.4          2.57      12.89
      5.49    408.19    .902E+06    1229.0          2.71      12.23
      5.86    408.56    .103E+07    1476.4          2.84      11.66
      6.24    408.94    .117E+07    1745.6          2.96      11.18
      6.62    409.32    .132E+07    2034.5          3.07      10.79
      7.00    409.70    .147E+07    2353.2          3.17      10.44
```

```
                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2520)  575.61     8.27    2.67  17.70      1.26      1.47
   OUTFLOW: ID= 1 (  4500)  575.61     7.81    3.00  17.69      1.23      1.44
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   1.221 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  14.315
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.279

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  4500):   575.61   7.806     3.00    17.69
      + ID2= 2 (  0610):    78.05   1.221     2.67    14.32
        ================================================
        ID = 3 (  2610):   653.66   8.969     2.97    17.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.193 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.842
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.289 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.841
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   0.504 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.284 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.191 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.842
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
```

```
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0360      Main Channel
                  4.30        412.70        0.0360      Main Channel
                  8.60        414.20        0.0360      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .108E+02       0.0          0.24      42.13
      0.16   412.86    .434E+02       0.0          0.38      26.54
      0.24   412.94    .976E+02       0.1          0.50      20.26
      0.32   413.02    .174E+03       0.2          0.61      16.72
      0.39   413.09    .271E+03       0.3          0.70      14.41
      0.47   413.17    .390E+03       0.5          0.79      12.76
      0.55   413.25    .532E+03       0.8          0.88      11.51
      0.63   413.33    .694E+03       1.1          0.96      10.53
      0.71   413.41    .879E+03       1.5          1.04       9.74
      0.79   413.49    .108E+04       2.0          1.11       9.08
      0.87   413.57    .131E+04       2.6          1.19       8.52
      0.95   413.65    .156E+04       3.2          1.26       8.04
      1.03   413.73    .183E+04       4.0          1.33       7.62
      1.11   413.81    .213E+04       4.9          1.39       7.25
      1.18   413.88    .244E+04       5.9          1.46       6.93
      1.26   413.96    .278E+04       7.0          1.52       6.64
      1.34   414.04    .313E+04       8.2          1.59       6.37
      1.42   414.12    .351E+04       9.5          1.65       6.13
      1.50   414.20    .392E+04      11.0          1.71       5.92

                                <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0625)    6.72     0.19    1.83  13.84      0.33      0.62
   OUTFLOW: ID= 1 (  4625)    6.72     0.16    2.08  13.81      0.31      0.59



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.64         0.42
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      84.06        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        44.18
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       2.04 (ii)   11.83 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.31         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.03          0.198 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      50.35        18.33          34.33
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.36           0.67
```

```
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.163     2.08    13.81
     + ID2= 2 (  0621):     6.56   0.193     1.83    13.84
       ================================================
       ID = 3 (  2625):    13.28   0.336     2.00    13.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    13.28   0.336     2.00    13.83
     + ID2= 2 (  0622):     9.69   0.289     1.83    13.84
       ================================================
       ID = 1 (  2625):    22.97   0.616     1.92    13.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    22.97   0.616     1.92    13.83
     + ID2= 2 (  0623):    19.37   0.504     1.92    13.84
       ================================================
       ID = 3 (  2625):    42.34   1.119     1.92    13.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    42.34   1.119     1.92    13.84
     + ID2= 2 (  0624):    11.84   0.284     2.00    13.84
       ================================================
       ID = 1 (  2625):    54.18   1.398     1.92    13.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    54.18   1.398     1.92    13.84
```

```
 + ID2= 2 (  0626):     1.06   0.198     1.33    34.33
   ================================================
   ID = 3 (  2625):    55.24   1.433     1.92    14.23

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

  Unit Hyd Qpeak  (cms)=   1.793

  PEAK FLOW       (cms)=   0.391 (i)
  TIME TO PEAK    (hrs)=   1.583
  RUNOFF VOLUME    (mm)=  13.818
  TOTAL RAINFALL   (mm)=  51.355
  RUNOFF COEFFICIENT   =   0.269

  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
  Surface Area     (ha)=       0.71         0.08
  Dep. Storage     (mm)=       0.52         7.16
  Average Slope     (%)=       2.00         2.00
  Length            (m)=      20.00        20.00
  Mannings n             =    0.013        0.250

  Max.Eff.Inten.(mm/hr)=     134.65       192.97
            over (min)         5.00         5.00
  Storage Coeff.  (min)=       0.70 (ii)    2.60 (ii)
  Unit Hyd. Tpeak (min)=       5.00         5.00
  Unit Hyd. peak  (cms)=       0.34         0.29
                                                      *TOTALS*
  PEAK FLOW       (cms)=       0.21         0.05          0.253 (iii)
  TIME TO PEAK    (hrs)=       1.33         1.33           1.33
  RUNOFF VOLUME    (mm)=      50.83        30.46          44.72
  TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
  RUNOFF COEFFICIENT   =       0.99         0.59           0.87

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN*  =  74.0    Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
   (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
  Surface Area     (ha)=       1.18         0.78
  Dep. Storage     (mm)=       0.52         7.16
  Average Slope     (%)=       2.00         2.00
  Length            (m)=      40.00        40.00
  Mannings n             =    0.013        0.250

  Max.Eff.Inten.(mm/hr)=     134.65        60.16
            over (min)         5.00        10.00
  Storage Coeff.  (min)=       1.06 (ii)    9.71 (ii)
  Unit Hyd. Tpeak (min)=       5.00        10.00
  Unit Hyd. peak  (cms)=       0.34         0.11
                                                      *TOTALS*
  PEAK FLOW       (cms)=       0.29         0.08          0.329 (iii)
  TIME TO PEAK    (hrs)=       1.33         1.50           1.33
  RUNOFF VOLUME    (mm)=      50.83        20.46          32.60
  TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
  RUNOFF COEFFICIENT   =       0.99         0.40           0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
         CN*  =  74.0    Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
   (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.329     1.33    32.60
     + ID2= 2 (  6240):     0.79   0.253     1.33    44.72
       ================================================
       ID = 3 ( 26240):     2.75   0.582     1.33    36.09

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000  |    0.1390      0.0686
                           0.0060      0.0042  |    0.1510      0.0822
                           0.0130      0.0130  |    0.1630      0.0967
                           0.0200      0.0250  |    0.1730      0.1121
                           0.0250      0.0328  |    0.1780      0.1202
                           0.0290      0.0439  |    2.5750      0.1742
                           0.1260      0.0558  |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
  INFLOW : ID= 2 ( 26240)      2.750     0.582      1.33       36.09
  OUTFLOW: ID= 1 ( 46240)      2.750     0.118      1.75       36.02

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.32
                TIME SHIFT OF PEAK FLOW         (min)= 25.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0550

--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

```
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.37         0.55
     Dep. Storage     (mm)=      0.52         7.16
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     40.00        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    134.65        48.06
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      1.06 (ii)   10.52 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.34         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.07         0.04          0.080 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=     50.83        18.73          25.14
     TOTAL RAINFALL   (mm)=     51.35        51.35          51.35
     RUNOFF COEFFICIENT   =      0.99         0.36           0.49

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.


--------------------------------------------------------------------------------
-------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.2590      0.0708
                          0.0050      0.0089   |    0.2910      0.0871
                          0.0100      0.0187   |    0.3210      0.1045
                          0.0130      0.0298   |    0.3720      0.1438
                          0.0150      0.0422   |    2.8080      0.2087
                          0.2220      0.0559   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)     0.920      0.080      1.33      25.14
   OUTFLOW: ID= 1 ( 46220)     0.920      0.009      2.83      24.65

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.87
                 TIME SHIFT OF PEAK FLOW         (min)= 90.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.0162

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.05         0.43
     Dep. Storage     (mm)=      0.52         7.16
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     20.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    134.65        29.87
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.70 (ii)    8.25 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.01         0.02          0.028 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=     50.83        15.39          17.15
     TOTAL RAINFALL   (mm)=     51.35        51.35          51.35
     RUNOFF COEFFICIENT   =      0.99         0.30           0.33

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.009     2.83    24.65
     + ID2= 2 ( 46240):     2.75   0.118     1.75    36.02
       ================================================
       ID = 3 (  0004):     3.67   0.125     1.83    33.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):     3.67   0.125     1.83    33.17
     + ID2= 2 (  6230):     0.48   0.028     1.50    17.15
       ================================================
       ID = 1 (  0004):     4.15   0.142     1.75    31.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  0.00         414.20        0.0350      Main Channel
                  4.30         412.70        0.0350      Main Channel
                  8.60         414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
```

(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.08	412.78	.456E+01	0.0	0.55	7.70
0.16	412.86	.182E+02	0.1	0.88	4.85
0.24	412.94	.410E+02	0.2	1.15	3.70
0.32	413.02	.729E+02	0.4	1.39	3.05
0.39	413.09	.114E+03	0.7	1.61	2.63
0.47	413.17	.164E+03	1.2	1.82	2.33
0.55	413.25	.223E+03	1.8	2.02	2.10
0.63	413.33	.292E+03	2.5	2.21	1.92
0.71	413.41	.369E+03	3.5	2.39	1.78
0.79	413.49	.456E+03	4.6	2.56	1.66
0.87	413.57	.551E+03	5.9	2.73	1.56
0.95	413.65	.656E+03	7.4	2.89	1.47
1.03	413.73	.770E+03	9.2	3.05	1.39
1.11	413.81	.893E+03	11.2	3.21	1.32
1.18	413.88	.103E+04	13.5	3.36	1.27
1.26	413.96	.117E+04	16.0	3.51	1.21
1.34	414.04	.132E+04	18.9	3.65	1.16
1.42	414.12	.148E+04	22.0	3.79	1.12
1.50	414.20	.165E+04	25.4	3.93	1.08

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0004)	4.15	0.14	1.75	31.32	0.21	1.04
OUTFLOW: ID= 1 (4620)	4.15	0.14	1.81	31.12	0.21	1.03

ADD HYD (0117) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2625):	55.24	1.433	1.92	14.23
+ ID2= 2 (4620):	4.15	0.139	1.81	31.12
ID = 3 (0117):	59.39	1.569	1.92	15.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0117) | 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0117):	59.39	1.569	1.92	15.41
+ ID2= 2 (0627):	9.39	0.391	1.58	13.82
ID = 1 (0117):	68.78	1.827	1.83	15.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0116) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0117):	68.78	1.827	1.83	15.19
+ ID2= 2 (2610):	653.66	8.969	2.97	17.29
ID = 3 (0116):	722.44	9.671	2.86	17.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0637) | ID= 1 DT= 5.0 min			
	Area (ha)=	8.36	Curve Number (CN)= 70.0
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.47	

Unit Hyd Qpeak (cms)= 0.679

PEAK FLOW (cms)= 0.211 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 13.843
TOTAL RAINFALL (mm)= 51.355
RUNOFF COEFFICIENT = 0.270

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0630) | ID= 1 DT= 5.0 min			
	Area (ha)=	33.04	Curve Number (CN)= 70.0
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.38	

Unit Hyd Qpeak (cms)= 3.321

PEAK FLOW (cms)= 0.956 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 13.842
TOTAL RAINFALL (mm)= 51.355
RUNOFF COEFFICIENT = 0.270

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4630) | IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.893E+01	0.0	0.17	47.72
0.16	412.86	.357E+02	0.0	0.28	30.06
0.24	412.94	.804E+02	0.1	0.36	22.94
0.32	413.02	.143E+03	0.1	0.44	18.94
0.39	413.09	.223E+03	0.2	0.51	16.32
0.47	413.17	.322E+03	0.4	0.58	14.45
0.55	413.25	.438E+03	0.6	0.64	13.04
0.63	413.33	.572E+03	0.8	0.70	11.93
0.71	413.41	.724E+03	1.1	0.76	11.03
0.79	413.49	.893E+03	1.4	0.81	10.28
0.87	413.57	.108E+04	1.9	0.86	9.65
0.95	413.65	.129E+04	2.4	0.92	9.10
1.03	413.73	.151E+04	2.9	0.97	8.63

```
      1.11   413.81    .175E+04       3.6          1.01       8.22
      1.18   413.88    .201E+04       4.3          1.06       7.85
      1.26   413.96    .229E+04       5.1          1.11       7.52
      1.34   414.04    .258E+04       6.0          1.15       7.22
      1.42   414.12    .289E+04       6.9          1.20       6.95
      1.50   414.20    .323E+04       8.0          1.24       6.70

                                <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0630)   33.04     0.96    1.83  13.84      0.67      0.73
  OUTFLOW: ID= 1 (  4630)   33.04     0.87    2.00  13.83      0.65      0.71



--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0116):   722.44   9.671     2.86    17.09
     + ID2= 2 (  4630):    33.04   0.866     2.00    13.83
       ================================================
       ID = 3 (  2637):   755.48  10.085     2.81    16.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   755.48  10.085     2.81    16.95
     + ID2= 2 (  0637):     8.36   0.211     2.00    13.84
       ================================================
       ID = 1 (  2637):   763.84  10.191     2.78    16.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.083 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   763.84  10.191     2.78    16.91
     + ID2= 2 (  0636):     3.32   0.083     2.00    13.84
       ================================================
       ID = 3 (  2636):   767.16  10.235     2.78    16.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.46

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   0.528 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.123 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  13.843
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   767.16  10.235     2.78    16.90
     + ID2= 2 (  0638):    20.63   0.528     1.92    13.84
       ================================================
       ID = 3 (  2630):   787.79  10.500     2.72    16.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   787.79  10.500     2.72    16.82
     + ID2= 2 (  0639):     4.60   0.123     1.92    13.84
       ================================================
       ID = 1 (  2630):   792.39  10.559     2.72    16.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0709)|   Area    (ha)=  21.19   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.65

     Unit Hyd Qpeak  (cms)=   1.245

     PEAK FLOW       (cms)=   0.432 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  13.844
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

 FINISH
================================================================================
--------------------
  ***********************************************
  ** SIMULATION : 10 year Fergus Shand Dam Chic **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2126.000
| Ptotal= 61.34 mm |                          B=  15.000
--------------------                          C=   0.890
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.71 |  1.00   19.98 |  2.00   11.15 |  3.00    4.04
                0.08    2.94 |  1.08   32.79 |  2.08    9.83 |  3.08    3.82
                0.17    3.21 |  1.17   70.46 |  2.17    8.76 |  3.17    3.63
                0.25    3.53 |  1.25  147.79 |  2.25    7.89 |  3.25    3.45
                0.33    3.92 |  1.33   87.01 |  2.33    7.16 |  3.33    3.29
                0.42    4.40 |  1.42   53.99 |  2.42    6.55 |  3.42    3.14
                0.50    5.01 |  1.50   37.57 |  2.50    6.03 |  3.50    3.01
                0.58    5.79 |  1.58   28.09 |  2.58    5.58 |  3.58    2.89
                0.67    6.84 |  1.67   22.06 |  2.67    5.19 |  3.67    2.77
                0.75    8.31 |  1.75   17.96 |  2.75    4.84 |  3.75    2.67
                0.83   10.47 |  1.83   15.02 |  2.83    4.54 |  3.83    2.57
                0.92   13.90 |  1.92   12.83 |  2.92    4.27 |  3.92    2.48


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   2.536 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  18.624
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.304

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.407 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  24.021
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    8.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.84         0.56          1.115 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.49
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0201):    14.60   0.407     2.58    24.02
```

```
      + ID2= 2 (  0203):     8.20   1.115     1.33    33.49
        ================================================
        ID = 3 (  2200):    22.80   1.131     1.33    27.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000  |    0.1980      0.2314
                           0.0040      0.0218  |    0.2920      0.2621
                           0.0060      0.0446  |    0.3980      0.2937
                           0.0070      0.0683  |    0.5150      0.3261
                           0.0080      0.0930  |    0.8290      0.3592
                           0.0090      0.1187  |    1.3520      0.3930
                           0.0230      0.1453  |    2.0570      0.4275
                           0.0610      0.1730  |    2.9590      0.4629
                           0.1200      0.2017  |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800     1.131      1.33      27.43
   OUTFLOW: ID= 1 (  5200)     22.800     0.410      3.17      27.37

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 36.23
                  TIME SHIFT OF PEAK FLOW         (min)=110.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2970

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.433 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.661
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.663

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    8.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.027 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.46
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.433     1.83    40.66
     + ID2= 2 (  0206):     0.20   0.027     1.33    33.46
       ================================================
       ID = 3 (  2201):     5.00   0.443     1.83    40.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.443     1.83    40.37
     + ID2= 2 (  5200):    22.80   0.410     3.17    27.37
       ================================================
       ID = 1 (  2201):    27.80   0.579     2.00    29.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------

                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        37.22
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.10 (ii)   12.38 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.16          0.181 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.58
     RUNOFF VOLUME    (mm)=      59.34        21.28          24.32
```

```
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.35           0.40

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
            YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    8.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.09          0.177 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.49
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.177     1.33    33.49
     + ID2= 2 (  0209):     2.70   0.181     1.58    24.32
       ================================================
       ID = 3 (  2202):     4.00   0.313     1.50    27.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.313     1.50    27.30
     + ID2= 2 (  2201):    27.80   0.579     2.00    29.70
       ================================================
       ID = 1 (  2202):    31.80   0.740     1.83    29.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   2.536     2.83    18.62
     + ID2= 2 (  2202):    31.80   0.740     1.83    29.40
       ================================================
       ID = 3 (  2100):   168.78   3.097     2.83    20.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.138 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  24.019
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.95 (ii)    8.82 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.45         0.29          0.593 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.49
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
```

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.138     1.92    24.02
     + ID2= 2 (  0304):     4.40   0.593     1.33    33.49
       ================================================
       ID = 3 (  2300):     7.30   0.613     1.33    29.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.09         0.11
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    147.79        63.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.95 (ii)    8.82 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.02         0.01         0.027 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=     59.34        24.87         33.47
     TOTAL RAINFALL   (mm)=     61.34        61.34         61.34
     RUNOFF COEFFICIENT   =      0.97         0.41          0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.91         4.79
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    147.79        42.42
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.90 (ii)    9.64 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.19         0.38         0.447 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.50
     RUNOFF VOLUME    (mm)=     59.34        21.28         24.32
     TOTAL RAINFALL   (mm)=     61.34        61.34         61.34
     RUNOFF COEFFICIENT   =      0.97         0.35          0.40

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.613     1.33    29.73
     + ID2= 2 (  0308):     0.20   0.027     1.33    33.47
       ================================================
       ID = 3 (  2301):     7.50   0.640     1.33    29.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.640     1.33    29.83
     + ID2= 2 (  0310):     5.70   0.447     1.50    24.32
       ================================================
       ID = 1 (  2301):    13.20   1.046     1.42    27.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   3.097     2.83    20.65
     + ID2= 2 (  2301):    13.20   1.046     1.42    27.45
       ================================================
       ID = 3 (  2302):   181.98   3.268     2.75    21.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
```

```
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     101.75        34.92
               over (min)       15.00        25.00
     Storage Coeff.  (min)=      13.97 (ii)   24.72 (ii)
     Unit Hyd. Tpeak (min)=      15.00        25.00
     Unit Hyd. peak  (cms)=       0.08         0.05
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.48         3.39          3.711 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.83           1.75
     RUNOFF VOLUME    (mm)=      59.34        20.39          21.56
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.33           0.35

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   3.268     2.75    21.15
     + ID2= 2 (  0400):    82.86   3.711     1.75    21.56
       ================================================
       ID = 3 (  2400):   264.84   6.060     1.83    21.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        411.10        0.0550
                 27.30        410.20        0.0550
                 77.50        409.10        0.0550
                 96.60        409.10        0.0550
                115.80        408.90        0.0550
                124.80        409.10        0.0550
                131.00        408.90    0.0550 /0.0350  Main Channel
                133.60        408.00        0.0350      Main Channel
                134.40        407.60        0.0350      Main Channel
                135.00        407.50        0.0350      Main Channel
                135.80        407.60        0.0350      Main Channel
                136.50        408.00        0.0350      Main Channel
                139.40        408.80    0.0350 /0.0550  Main Channel
                143.50        408.90        0.0550
                148.50        408.70        0.0550
                163.80        408.90        0.0550
                183.20        408.90        0.0550
                243.70        409.70        0.0550
                278.70        410.20        0.0550
                330.50        411.40        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.19   407.69    .366E+03       0.1         0.51       58.83
      0.37   407.87    .106E+04       0.5         0.81       37.08
      0.56   408.06    .199E+04       1.1         1.00       29.93
      0.74   408.24    .328E+04       2.1         1.14       26.32
      0.93   408.43    .498E+04       3.6         1.28       23.32
      1.11   408.61    .708E+04       5.6         1.43       20.94
      1.30   408.80    .105E+05       8.5         1.45       20.61
      1.49   408.99    .247E+05      14.8         1.07       27.91
      1.68   409.18    .601E+05      30.4         0.91       32.97
      1.87   409.37    .109E+06      58.5         0.96       31.05
      2.06   409.56    .166E+06      98.3         1.06       28.11
      2.25   409.75    .231E+06     150.3         1.17       25.57
      2.44   409.94    .303E+06     215.4         1.28       23.46
      2.64   410.14    .383E+06     293.8         1.38       21.74
      2.83   410.33    .470E+06     390.1         1.49       20.10
      3.02   410.52    .563E+06     502.4         1.60       18.66
      3.21   410.71    .660E+06     628.8         1.71       17.48
      3.40   410.90    .762E+06     769.5         1.81       16.49
      3.59   411.09    .868E+06     924.9         1.91       15.65

                                  <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84     6.06    1.83  21.28      1.14      1.43
   OUTFLOW: ID= 1 (  4400)  264.84     5.32    2.33  21.20      1.09      1.40


    **** WARNING : THE HYD WAS CUT TO 2000 POINTS

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.187 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  18.213
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.297

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.09
```

```
     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   2.120 (i)
     TIME TO PEAK    (hrs)=   2.750
     RUNOFF VOLUME    (mm)=  21.892
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.357

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .206E+02       0.0         0.19      101.61
        0.16   412.86    .822E+02       0.0         0.30       64.01
        0.24   412.94    .185E+03       0.1         0.39       48.85
        0.32   413.02    .329E+03       0.1         0.48       40.33
        0.39   413.09    .514E+03       0.2         0.55       34.75
        0.47   413.17    .740E+03       0.4         0.62       30.77
        0.55   413.25    .101E+04       0.6         0.69       27.77
        0.63   413.33    .132E+04       0.9         0.75       25.40
        0.71   413.41    .166E+04       1.2         0.82       23.48
        0.79   413.49    .206E+04       1.6         0.88       21.89
        0.87   413.57    .249E+04       2.0         0.93       20.54
        0.95   413.65    .296E+04       2.5         0.99       19.39
        1.03   413.73    .347E+04       3.1         1.04       18.38
        1.11   413.81    .403E+04       3.8         1.10       17.49
        1.18   413.88    .462E+04       4.6         1.15       16.71
        1.26   413.96    .526E+04       5.5         1.20       16.00
        1.34   414.04    .594E+04       6.4         1.25       15.37
        1.42   414.12    .666E+04       7.5         1.30       14.79
        1.50   414.20    .742E+04       8.7         1.34       14.27

                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0510)   91.44     2.12    2.75  21.89      0.88      0.94
   OUTFLOW: ID= 1 (  4510)   91.44     2.01    3.00  21.89      0.86      0.93



-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.113 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  21.885
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.357

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43         26.43
     Dep. Storage     (mm)=       0.80          1.50
     Average Slope     (%)=       1.00          1.00
     Length            (m)=     593.69         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     147.79         71.37
               over (min)         5.00         20.00
     Storage Coeff.  (min)=       6.36 (ii)    16.31 (ii)
     Unit Hyd. Tpeak (min)=       5.00         20.00
     Unit Hyd. peak  (cms)=       0.18          0.06
                                                            *TOTALS*
     PEAK FLOW       (cms)=       4.54          2.68          5.388 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.67           1.42
     RUNOFF VOLUME    (mm)=      60.54         27.03          37.09
     TOTAL RAINFALL   (mm)=      61.34         61.34          61.34
     RUNOFF COEFFICIENT   =       0.99          0.44           0.60


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85          5.93
     Dep. Storage     (mm)=       0.80          1.50
     Average Slope     (%)=       1.00          1.00
     Length            (m)=     268.08         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     147.79         34.87
               over (min)         5.00         20.00
     Storage Coeff.  (min)=       3.95 (ii)    17.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00         20.00
     Unit Hyd. peak  (cms)=       0.24          0.06
                                                            *TOTALS*
     PEAK FLOW       (cms)=       1.65          0.33          1.726 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.67           1.33
     RUNOFF VOLUME    (mm)=      60.54         21.89          39.28
     TOTAL RAINFALL   (mm)=      61.34         61.34          61.34
     RUNOFF COEFFICIENT   =       0.99          0.36           0.64
```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2511)|	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0511):		52.87	5.388	1.42	37.09
+ ID2= 2 (0516):		10.78	1.726	1.33	39.28
ID = 3 (2511):		63.65	6.912	1.33	37.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(4511)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.					
		0.7700	0.9000	3.2130	1.6220
		1.6000	1.1400	3.9540	1.8810
		2.2900	1.2810	4.9000	2.3000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (2511)	63.650	6.912	1.33	37.46
OUTFLOW: ID= 1 (4511)	63.650	2.331	2.17	37.45

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.73
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 1.2977

ADD HYD (2510)|	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (4510):		91.44	2.008	3.00	21.89
+ ID2= 2 (4511):		63.65	2.331	2.17	37.45
ID = 3 (2510):		155.09	3.740	2.50	28.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2510)|	AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (2510):		155.09	3.740	2.50	28.27
+ ID2= 2 (0517):		2.14	0.113	1.75	21.88
ID = 1 (2510):		157.23	3.782	2.50	28.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
STANDHYD (0512)		Area (ha)= 27.13		
ID= 1 DT= 5.0 min		Total Imp(%)= 50.00	Dir. Conn.(%)= 30.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	13.56	13.56	
Dep. Storage	(mm)=	0.80	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	425.28	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		147.79	71.37	
over (min)		5.00	15.00	
Storage Coeff. (min)=		5.21 (ii)	13.29 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.21	0.08	
				TOTALS
PEAK FLOW	(cms)=	2.53	1.54	3.164 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.42
RUNOFF VOLUME	(mm)=	60.54	27.03	37.09
TOTAL RAINFALL	(mm)=	61.34	61.34	61.34
RUNOFF COEFFICIENT	=	0.99	0.44	0.60

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0513)		Area (ha)= 6.44		
ID= 1 DT= 5.0 min		Total Imp(%)= 65.00	Dir. Conn.(%)= 35.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.19	2.25	
Dep. Storage	(mm)=	0.80	1.50	
Average Slope	(%)=	1.00	1.00	
Length	(m)=	207.20	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		147.79	112.86	
over (min)		5.00	15.00	
Storage Coeff. (min)=		3.38 (ii)	11.66 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.26	0.09	
				TOTALS
PEAK FLOW	(cms)=	0.80	0.43	0.953 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.33
RUNOFF VOLUME	(mm)=	60.54	31.48	41.65
TOTAL RAINFALL	(mm)=	61.34	61.34	61.34
RUNOFF COEFFICIENT	=	0.99	0.51	0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

DUHYD (8512)					
Inlet Cap.= 0.732					
#of Inlets= 1					
Total(cms)= 0.7		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	TOTAL HYD.(ID= 1):	6.44	0.95	1.33	41.65
	MAJOR SYS.(ID= 2):	0.33	0.22	1.33	41.65
	MINOR SYS.(ID= 3):	6.11	0.73	1.33	41.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2512)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0512):	27.13	3.164	1.42	37.09
+	ID2= 2 (8512):	6.11	0.732	1.33	41.65
	ID = 3 (2512):	33.24	3.896	1.42	37.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(5512)| IN= 2---> OUT= 1 | DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.6640	0.9151
	0.0210	0.1601	0.8570	1.0220
	0.0360	0.3317	1.0660	1.1320
	0.0410	0.4218	1.2900	1.2450
	0.1000	0.5147	1.5290	1.3610
	0.2030	0.6105	1.7810	1.4800
	0.3340	0.7092	2.0460	1.6020
	0.4890	0.8107	2.3220	1.7260

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2512)		33.244	3.896	1.42	37.93
OUTFLOW: ID= 1 (5512)		33.244	0.628	2.50	37.87

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.12
TIME SHIFT OF PEAK FLOW (min)= 65.00
MAXIMUM STORAGE USED (ha.m.)= 0.8939

ADD HYD (2514)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2510):	157.23	3.782	2.50	28.19
+	ID2= 2 (0515):	5.01	0.187	1.83	18.21
	ID = 3 (2514):	162.24	3.886	2.50	27.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2514)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (2514):	162.24	3.886	2.50	27.88
+	ID2= 2 (5512):	33.24	0.628	2.50	37.87
	ID = 1 (2514):	195.48	4.515	2.50	29.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | NASHYD (0058)| ID= 1 DT= 5.0 min	Area (ha)= 6.68	Curve Number (CN)= 71.0
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.20	

Unit Hyd Qpeak (cms)= 1.276

PEAK FLOW (cms)= 0.405 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 19.792
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.323

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2513)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2514):	195.48	4.515	2.50	29.58
+	ID2= 2 (4400):	264.84	5.316	2.33	21.20
	ID = 3 (2513):	460.32	9.800	2.42	24.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2513)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (2513):	460.32	9.800	2.42	24.63
+	ID2= 2 (0058):	6.68	0.405	1.58	19.79
	ID = 1 (2513):	467.00	9.900	2.39	24.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | NASHYD (0520)| ID= 1 DT= 5.0 min	Area (ha)= 108.36	Curve Number (CN)= 71.0
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.20	

Unit Hyd Qpeak (cms)= 3.449

```
     PEAK FLOW       (cms)=   2.103 (i)
     TIME TO PEAK    (hrs)=   2.917
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   467.00   9.900     2.39    24.56
     + ID2= 2 (  0520):   108.36   2.103     2.92    19.83
       ==================================================
       ID = 3 (  2520):   575.36  11.791     2.50    23.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         409.70        0.0550
                  19.70         408.80        0.0550
                  41.70         407.20        0.0550
                  60.50         405.30        0.0550
                  80.00         404.50        0.0550
                  95.70         404.60    0.0550 /0.0350  Main Channel
                  98.60         403.40        0.0350      Main Channel
                 100.40         403.40        0.0350      Main Channel
                 100.80         402.90        0.0350      Main Channel
                 101.50         402.70        0.0350      Main Channel
                 102.30         402.80        0.0350      Main Channel
                 103.30         403.20        0.0350      Main Channel
                 104.00         403.20        0.0350      Main Channel
                 105.60         404.40    0.0350 /0.0550  Main Channel
                 109.70         404.30        0.0550
                 128.60         404.20        0.0550
                 154.10         405.40        0.0550
                 179.10         406.70        0.0550
                 201.90         408.60        0.0550
                 224.20         410.60        0.0550

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.34   403.04    .954E+03       0.3          0.70      47.40
        0.68   403.38    .304E+04       1.6          1.03      32.27
        1.02   403.72    .718E+04       4.5          1.25      26.57
        1.36   404.06    .122E+05       9.7          1.58      20.96
        1.70   404.40    .251E+05      18.1          1.44      23.04
        2.08   404.78    .650E+05      42.3          1.29      25.62
        2.46   405.16    .122E+06      86.3          1.40      23.62
        2.84   405.54    .192E+06     151.6          1.57      21.10
        3.21   405.91    .270E+06     238.3          1.75      18.90
        3.59   406.29    .357E+06     345.8          1.93      17.20
        3.97   406.67    .452E+06     474.9          2.09      15.85
        4.35   407.05    .554E+06     631.1          2.26      14.63
        4.73   407.43    .663E+06     807.8          2.42      13.67
        5.11   407.81    .779E+06    1006.4          2.57      12.89
        5.49   408.19    .902E+06    1229.0          2.71      12.23
        5.86   408.56    .103E+07    1476.4          2.84      11.66
        6.24   408.94    .117E+07    1745.6          2.96      11.18
        6.62   409.32    .132E+07    2034.5          3.07      10.79
        7.00   409.70    .147E+07    2353.2          3.17      10.44
```

```
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
  INFLOW : ID= 2 (  2520)  575.36    11.79    2.50  23.67      1.44       1.54
  OUTFLOW: ID= 1 (  4500)  575.36    11.12    2.94  23.66      1.41       1.56
```

```
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   1.733 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   575.36  11.119     2.94    23.66
     + ID2= 2 (  0610):    78.05   1.733     2.67    19.83
       ==================================================
       ID = 3 (  2610):   653.41  12.786     2.89    23.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.274 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.213
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.412 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.213
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   0.718 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  19.215
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.405 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  19.216
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.272 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.214
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0360      Main Channel
                   4.30        412.70        0.0360      Main Channel
                   8.60        414.20        0.0360      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .108E+02       0.0         0.24      42.13
        0.16   412.86    .434E+02       0.0         0.38      26.54
        0.24   412.94    .976E+02       0.1         0.50      20.26
        0.32   413.02    .174E+03       0.2         0.61      16.72
        0.39   413.09    .271E+03       0.3         0.70      14.41
        0.47   413.17    .390E+03       0.5         0.79      12.76
        0.55   413.25    .532E+03       0.8         0.88      11.51
        0.63   413.33    .694E+03       1.1         0.96      10.53
        0.71   413.41    .879E+03       1.5         1.04       9.74
        0.79   413.49    .108E+04       2.0         1.11       9.08
        0.87   413.57    .131E+04       2.6         1.19       8.52
        0.95   413.65    .156E+04       3.2         1.26       8.04
        1.03   413.73    .183E+04       4.0         1.33       7.62
        1.11   413.81    .213E+04       4.9         1.39       7.25
        1.18   413.88    .244E+04       5.9         1.46       6.93
        1.26   413.96    .278E+04       7.0         1.52       6.64
        1.34   414.04    .313E+04       8.2         1.59       6.37
        1.42   414.12    .351E+04       9.5         1.65       6.13
        1.50   414.20    .392E+04      11.0         1.71       5.92

                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0625)    6.72     0.27    1.83  19.21      0.37      0.67
   OUTFLOW: ID= 1 (  4625)    6.72     0.24    2.08  19.18      0.35      0.65

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.64         0.42
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      84.06        40.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        57.12
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.97 (ii)   10.80 (ii)
```

```
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.31         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.04          0.222 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      60.34        24.57          42.45
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.98         0.40           0.69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.236     2.08    19.18
     + ID2= 2 (  0621):     6.56   0.274     1.83    19.21
       ================================================
       ID = 3 (  2625):    13.28   0.487     1.92    19.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    13.28   0.487     1.92    19.20
     + ID2= 2 (  0622):     9.69   0.412     1.83    19.21
       ================================================
       ID = 1 (  2625):    22.97   0.887     1.92    19.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    22.97   0.887     1.92    19.20
     + ID2= 2 (  0623):    19.37   0.718     1.92    19.22
       ================================================
       ID = 3 (  2625):    42.34   1.604     1.92    19.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    42.34   1.604     1.92    19.21
     + ID2= 2 (  0624):    11.84   0.405     2.00    19.22
       ================================================
       ID = 1 (  2625):    54.18   2.001     1.92    19.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    54.18   2.001     1.92    19.21
     + ID2= 2 (  0626):     1.06   0.222     1.33    42.45
       ================================================
       ID = 3 (  2625):    55.24   2.048     1.92    19.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.550 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.180
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79       238.82
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.68 (ii)    2.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.06          0.283 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      60.82        39.18          54.33
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.64           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        78.95
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.02 (ii)    8.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.12          0.377 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      60.82        27.57          40.87
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.45           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  6210):     1.96   0.377     1.33    40.87
      + ID2= 2 (  6240):     0.79   0.283     1.33    54.33
        ==================================================
        ID = 3 ( 26240):     2.75   0.660     1.33    44.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.1390      0.0686
                          0.0060      0.0042  |    0.1510      0.0822
                          0.0130      0.0130  |    0.1630      0.0967
                          0.0200      0.0250  |    0.1730      0.1121
                          0.0250      0.0328  |    0.1780      0.1202
                          0.0290      0.0439  |    2.5750      0.1742
                          0.1260      0.0558  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)     2.750      0.660      1.33      44.74
   OUTFLOW: ID= 1 ( 46240)     2.750      0.137      1.83      44.68

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.75
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0667

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.86
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.02 (ii)    9.47 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.07          0.105 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      60.82        25.49          32.55
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.42           0.53

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.2590      0.0708
                          0.0050      0.0089  |    0.2910      0.0871
                          0.0100      0.0187  |    0.3210      0.1045
                          0.0130      0.0298  |    0.3720      0.1438
                          0.0150      0.0422  |    2.8080      0.2087
                          0.2220      0.0559  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)     0.920      0.105      1.33      32.55
   OUTFLOW: ID= 1 ( 46220)     0.920      0.011      2.83      32.07

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.23
                  TIME SHIFT OF PEAK FLOW         (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0215
```

```
--------------------
| CALIB            |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.05         0.43
     Dep. Storage     (mm)=      0.52         7.16
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     20.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    147.79        40.87
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.68 (ii)    7.34 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.01         0.04          0.040 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=     60.82        21.40          23.36
     TOTAL RAINFALL   (mm)=     61.34        61.34          61.34
     RUNOFF COEFFICIENT   =      0.99         0.35           0.38

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.011     2.83    32.07
     + ID2= 2 ( 46240):     2.75   0.137     1.83    44.68
       ================================================
       ID = 3 (  0004):     3.67   0.147     1.92    41.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):     3.67   0.147     1.92    41.51
     + ID2= 2 (  6230):     0.48   0.040     1.50    23.36
       ================================================
       ID = 1 (  0004):     4.15   0.174     1.58    39.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00        414.20        0.0350      Main Channel
                    4.30        412.70        0.0350      Main Channel
                    8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)       (min)
       0.08   412.78    .456E+01       0.0          0.55        7.70
       0.16   412.86    .182E+02       0.1          0.88        4.85
       0.24   412.94    .410E+02       0.2          1.15        3.70
       0.32   413.02    .729E+02       0.4          1.39        3.05
       0.39   413.09    .114E+03       0.7          1.61        2.63
       0.47   413.17    .164E+03       1.2          1.82        2.33
       0.55   413.25    .223E+03       1.8          2.02        2.10
       0.63   413.33    .292E+03       2.5          2.21        1.92
       0.71   413.41    .369E+03       3.5          2.39        1.78
       0.79   413.49    .456E+03       4.6          2.56        1.66
       0.87   413.57    .551E+03       5.9          2.73        1.56
       0.95   413.65    .656E+03       7.4          2.89        1.47
       1.03   413.73    .770E+03       9.2          3.05        1.39
       1.11   413.81    .893E+03      11.2          3.21        1.32
       1.18   413.88    .103E+04      13.5          3.36        1.27
       1.26   413.96    .117E+04      16.0          3.51        1.21
       1.34   414.04    .132E+04      18.9          3.65        1.16
       1.42   414.12    .148E+04      22.0          3.79        1.12
       1.50   414.20    .165E+04      25.4          3.93        1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
  INFLOW : ID= 2 (  0004)    4.15    0.17    1.58  39.42      0.23      1.12
  OUTFLOW: ID= 1 (  4620)    4.15    0.17    1.67  39.16      0.23      1.11

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0117)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    55.24   2.048     1.92    19.66
     + ID2= 2 (  4620):     4.15   0.171     1.67    39.16
       ================================================
       ID = 3 (  0117):    59.39   2.212     1.92    21.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0117)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0117):    59.39   2.212     1.92    21.02
     + ID2= 2 (  0627):     9.39   0.550     1.58    19.18
       ================================================
       ID = 1 (  0117):    68.78   2.579     1.83    20.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  0116)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0117):    68.78   2.579     1.83    20.77
     + ID2= 2 (  2610):   653.41  12.786     2.89    23.21
       ================================================
       ID = 3 (  0116):   722.19  13.850     2.75    22.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679

     PEAK FLOW       (cms)=   0.301 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  19.215
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   1.360 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.214
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70        0.0350      Main Channel
                   8.60         414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17      47.72
       0.16   412.86    .357E+02       0.0          0.28      30.06
       0.24   412.94    .804E+02       0.1          0.36      22.94
       0.32   413.02    .143E+03       0.1          0.44      18.94
       0.39   413.09    .223E+03       0.2          0.51      16.32
       0.47   413.17    .322E+03       0.4          0.58      14.45
       0.55   413.25    .438E+03       0.6          0.64      13.04
       0.63   413.33    .572E+03       0.8          0.70      11.93
       0.71   413.41    .724E+03       1.1          0.76      11.03
       0.79   413.49    .893E+03       1.4          0.81      10.28
       0.87   413.57    .108E+04       1.9          0.86       9.65
       0.95   413.65    .129E+04       2.4          0.92       9.10
       1.03   413.73    .151E+04       2.9          0.97       8.63
       1.11   413.81    .175E+04       3.6          1.01       8.22
       1.18   413.88    .201E+04       4.3          1.06       7.85
       1.26   413.96    .229E+04       5.1          1.11       7.52
       1.34   414.04    .258E+04       6.0          1.15       7.22
       1.42   414.12    .289E+04       6.9          1.20       6.95
       1.50   414.20    .323E+04       8.0          1.24       6.70

                                  <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0630)   33.04     1.36    1.83  19.21      0.77      0.80
  OUTFLOW: ID= 1 (  4630)   33.04     1.25    2.00  19.21      0.75      0.78

-------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0116):   722.19  13.850     2.75    22.97
     + ID2= 2 (  4630):    33.04   1.251     2.00    19.21
       ================================================
       ID = 3 (  2637):   755.23  14.517     2.64    22.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   755.23  14.517     2.64    22.81
     + ID2= 2 (  0637):     8.36   0.301     2.00    19.22
       ================================================
       ID = 1 (  2637):   763.59  14.694     2.61    22.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.118 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  19.215
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313
```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2636)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (2637):	763.59	14.694	2.61	22.77
+	ID2= 2 (0636):	3.32	0.118	2.00	19.22
	ID = 3 (2636):	766.91	14.767	2.61	22.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0638)	Area (ha)=	20.63	Curve Number (CN)=	70.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.46		

Unit Hyd Qpeak (cms)= 1.713

PEAK FLOW (cms)= 0.753 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 19.215
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0639)	Area (ha)=	4.60	Curve Number (CN)=	70.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.43		

Unit Hyd Qpeak (cms)= 0.409

PEAK FLOW (cms)= 0.176 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 19.215
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2630)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (2636):	766.91	14.767	2.61	22.75
+	ID2= 2 (0638):	20.63	0.753	1.92	19.22
	ID = 3 (2630):	787.54	15.228	2.56	22.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2630)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (2630):	787.54	15.228	2.56	22.66
+	ID2= 2 (0639):	4.60	0.176	1.92	19.21
	ID = 1 (2630):	792.14	15.328	2.56	22.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0709)	Area (ha)=	21.19	Curve Number (CN)=	70.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.65		

Unit Hyd Qpeak (cms)= 1.245

PEAK FLOW (cms)= 0.616 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 19.216
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.313

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

****
** SIMULATION : 25 year Fergus Shand Dam Chic **
****

CHICAGO STORM	IDF curve parameters:	A=3023.000
Ptotal= 74.68 mm		B= 18.000
		C= 0.916
	used in:	INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 5.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	3.03	1.00	25.41	2.00	13.91	3.00	4.68
0.08	3.31	1.08	41.74	2.08	12.18	3.08	4.41
0.17	3.65	1.17	86.90	2.17	10.79	3.17	4.17
0.25	4.05	1.25	170.99	2.25	9.65	3.25	3.95
0.33	4.54	1.33	106.07	2.33	8.70	3.33	3.75
0.42	5.15	1.42	67.82	2.42	7.91	3.42	3.56
0.50	5.92	1.50	47.76	2.50	7.23	3.50	3.40
0.58	6.93	1.58	35.82	2.58	6.65	3.58	3.24
0.67	8.29	1.67	28.10	2.67	6.15	3.67	3.10
0.75	10.20	1.75	22.79	2.75	5.71	3.75	2.97
0.83	13.02	1.83	18.97	2.83	5.33	3.83	2.85
0.92	17.51	1.92	16.11	2.92	4.99	3.92	2.74

```
| CALIB           |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   3.656 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  26.414
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.354

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.567 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  32.968
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.441

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.85 (ii)    7.43 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.97         0.80          1.394 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.

     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.567     2.58    32.97
     + ID2= 2 (  0203):     8.20   1.394     1.33    43.88
       ================================================
       ID = 3 (  2200):    22.80   1.419     1.33    36.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1980      0.2314
                          0.0040      0.0218   |    0.2920      0.2621
                          0.0060      0.0446   |    0.3980      0.2937
                          0.0070      0.0683   |    0.5150      0.3261
                          0.0080      0.0930   |    0.8290      0.3592
                          0.0090      0.1187   |    1.3520      0.3930
                          0.0230      0.1453   |    2.0570      0.4275
                          0.0610      0.1730   |    2.9590      0.4629
                          0.1200      0.2017   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.419      1.33      36.89
   OUTFLOW: ID= 1 (  5200)     22.800      0.653      2.83      36.83

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 46.01
                 TIME SHIFT OF PEAK FLOW         (min)= 90.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.3407

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.568 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  52.802
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.707

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                         IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.85 (ii)    7.43 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.034 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28         43.85
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.97         0.46          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.568     1.83    52.80
     + ID2= 2 (  0206):     0.20   0.034     1.33    43.85
       ================================================
       ID = 3 (  2201):     5.00   0.581     1.83    52.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.581     1.83    52.44
     + ID2= 2 (  5200):    22.80   0.653     2.83    36.83
       ================================================
       ID = 1 (  2201):    27.80   0.888     2.00    39.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        58.93
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.04 (ii)   10.42 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.24          0.268 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.58
     RUNOFF VOLUME    (mm)=      72.68        29.82         33.25
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.97         0.40          0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.85 (ii)    7.43 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.13          0.221 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28         43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.97         0.46          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.221     1.33    43.88
     + ID2= 2 (  0209):     2.70   0.268     1.58    33.25
```

```
       ================================================
       ID = 3 (  2202):     4.00   0.452     1.50    36.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.452     1.50    36.70
     + ID2= 2 (  2201):    27.80   0.888     2.00    39.64
       ================================================
       ID = 1 (  2202):    31.80   1.104     1.83    39.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   3.656     2.83    26.41
     + ID2= 2 (  2202):    31.80   1.104     1.83    39.27
       ================================================
       ID = 3 (  2100):   168.78   4.532     2.75    28.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.192 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  32.965
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.441

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    7.85 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.52         0.42          0.741 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.192     1.92    32.97
     + ID2= 2 (  0304):     4.40   0.741     1.33    43.88
       ================================================
       ID = 3 (  2300):     7.30   0.780     1.42    39.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        86.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    7.85 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.034 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.86
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
```

```
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        58.93
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.85 (ii)    8.52 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.56          0.645 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=      72.68        29.82          33.25
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.40           0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.780     1.42    39.54
     + ID2= 2 (  0308):     0.20   0.034     1.33    43.86
       ================================================
       ID = 3 (  2301):     7.50   0.813     1.42    39.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.813     1.42    39.66
     + ID2= 2 (  0310):     5.70   0.645     1.50    33.25
       ================================================
       ID = 1 (  2301):    13.20   1.452     1.42    36.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   4.532     2.75    28.84
     + ID2= 2 (  2301):    13.20   1.452     1.42    36.89
       ================================================
       ID = 3 (  2302):   181.98   4.761     2.75    29.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     121.32        55.40
                 over (min)       15.00        25.00
     Storage Coeff.  (min)=      13.02 (ii)   21.96 (ii)
     Unit Hyd. Tpeak (min)=      15.00        25.00
     Unit Hyd. peak  (cms)=       0.08         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.60         5.12          5.557 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.83           1.75
     RUNOFF VOLUME    (mm)=      72.68        28.68          30.00
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.38           0.40

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   4.761     2.75    29.42
     + ID2= 2 (  0400):    82.86   5.557     1.75    30.00
       ================================================
       ID = 3 (  2400):   264.84   8.919     1.83    29.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 0.00         411.10        0.0550
                27.30         410.20        0.0550
                77.50         409.10        0.0550
                96.60         409.10        0.0550
               115.80         408.90        0.0550
```

124.80	409.10	0.0550	
131.00	408.90	0.0550 /0.0350	Main Channel
133.60	408.00	0.0350	Main Channel
134.40	407.60	0.0350	Main Channel
135.00	407.50	0.0350	Main Channel
135.80	407.60	0.0350	Main Channel
136.50	408.00	0.0350	Main Channel
139.40	408.80	0.0350 /0.0550	Main Channel
143.50	408.90	0.0550	
148.50	408.70	0.0550	
163.80	408.90	0.0550	
183.20	408.90	0.0550	
243.70	409.70	0.0550	
278.70	410.20	0.0550	
330.50	411.40	0.0550	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.19	407.69	.366E+03	0.1	0.51	58.83
0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66
3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2400)	264.84	8.92	1.83	29.60	1.31	1.42
OUTFLOW: ID= 1 (4400)	264.84	7.70	2.31	29.52	1.24	1.45

**** WARNING : THE HYD WAS CUT TO 2000 POINTS

CALIB NASHYD (0515) | ID= 1 DT= 5.0 min	Area (ha)= 5.01 Ia (mm)= 1.50 U.H. Tp(hrs)= 0.41	Curve Number (CN)= 65.0 # of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 0.467

PEAK FLOW (cms)= 0.265 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 25.502
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.342

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0510) | ID= 1 DT= 5.0 min	Area (ha)= 91.44 Ia (mm)= 1.50 U.H. Tp(hrs)= 1.09	Curve Number (CN)= 71.0 # of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 3.204

PEAK FLOW (cms)= 2.973 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 30.266
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.405

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4510) | IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.206E+02	0.0	0.19	101.61
0.16	412.86	.822E+02	0.0	0.30	64.01
0.24	412.94	.185E+03	0.1	0.39	48.85
0.32	413.02	.329E+03	0.1	0.48	40.33
0.39	413.09	.514E+03	0.2	0.55	34.75
0.47	413.17	.740E+03	0.4	0.62	30.77
0.55	413.25	.101E+04	0.6	0.69	27.77
0.63	413.33	.132E+04	0.9	0.75	25.40
0.71	413.41	.166E+04	1.2	0.82	23.48
0.79	413.49	.206E+04	1.6	0.88	21.89
0.87	413.57	.249E+04	2.0	0.93	20.54
0.95	413.65	.296E+04	2.5	0.99	19.39
1.03	413.73	.347E+04	3.1	1.04	18.38
1.11	413.81	.403E+04	3.8	1.10	17.49
1.18	413.88	.462E+04	4.6	1.15	16.71
1.26	413.96	.526E+04	5.5	1.20	16.00
1.34	414.04	.594E+04	6.4	1.25	15.37
1.42	414.12	.666E+04	7.5	1.30	14.79
1.50	414.20	.742E+04	8.7	1.34	14.27

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0510)	91.44	2.97	2.75	30.27	1.00	1.03
OUTFLOW: ID= 1 (4510)	91.44	2.84	3.00	30.26	0.98	1.01

```
| CALIB           |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.158 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  30.256
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.405

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------

                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43        26.43
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     593.69        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        95.30
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       6.00 (ii)   14.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.19         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       5.47         3.91          7.494 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.42
     RUNOFF VOLUME    (mm)=      73.88        36.68          47.84
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.49           0.64


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
-------------------

                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        47.89
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       3.72 (ii)   15.39 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.25         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.96         0.49          2.076 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      73.88        30.27          49.89
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.41           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   7.494     1.42    47.84
     + ID2= 2 (  0516):    10.78   2.076     1.33    49.89
       ================================================
       ID = 3 (  2511):    63.65   9.282     1.42    48.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.7700      0.9000   |    3.2130      1.6220
                          1.6000      1.1400   |    3.9540      1.8810
                          2.2900      1.2810   |    4.9000      2.3000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650      9.282      1.42      48.18
   OUTFLOW: ID= 1 (  4511)     63.650      3.199      2.08      48.18

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 34.46
                TIME SHIFT OF PEAK FLOW         (min)= 40.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.6168

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   2.836     3.00    30.26
     + ID2= 2 (  4511):    63.65   3.199     2.08    48.18
       ================================================
       ID = 3 (  2510):   155.09   5.325     2.67    37.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   5.325     2.67    37.61
     + ID2= 2 (  0517):     2.14   0.158     1.75    30.26
       ================================================
       ID = 1 (  2510):   157.23   5.372     2.58    37.51

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     13.56        13.56
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=    425.28        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    170.99        95.30
               over (min)        5.00        15.00
     Storage Coeff.  (min)=     4.91 (ii)   12.11 (ii)
     Unit Hyd. Tpeak (min)=     5.00        15.00
     Unit Hyd. peak  (cms)=     0.22         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=     3.02         2.18        4.053 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.58         1.42
     RUNOFF VOLUME    (mm)=    73.88        36.68        47.84
     TOTAL RAINFALL   (mm)=    74.68        74.68        74.68
     RUNOFF COEFFICIENT   =     0.99         0.49         0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.19         2.25
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         1.00
     Length            (m)=    207.20        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    170.99       148.20
               over (min)        5.00        15.00
     Storage Coeff.  (min)=     3.19 (ii)   10.62 (ii)
     Unit Hyd. Tpeak (min)=     5.00        15.00
     Unit Hyd. peak  (cms)=     0.27         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.95         0.59         1.170 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.58         1.33
     RUNOFF VOLUME    (mm)=    73.88        42.06        53.19
     TOTAL RAINFALL   (mm)=    74.68        74.68        74.68
     RUNOFF COEFFICIENT   =     0.99         0.56         0.71

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      1.17      1.33   53.19
     ================================================
     MAJOR SYS.(ID= 2):   0.79      0.44      1.33   53.19
     MINOR SYS.(ID= 3):   5.65      0.73      1.33   53.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   4.053     1.42    47.84
     + ID2= 2 (  8512):     5.65   0.732     1.33    53.19
       ================================================
       ID = 3 (  2512):    32.78   4.785     1.42    48.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.6640      0.9151
                           0.0210      0.1601   |    0.8570      1.0220
                           0.0360      0.3317   |    1.0660      1.1320
                           0.0410      0.4218   |    1.2900      1.2450
                           0.1000      0.5147   |    1.5290      1.3610
                           0.2030      0.6105   |    1.7810      1.4800
                           0.3340      0.7092   |    2.0460      1.6020
                           0.4890      0.8107   |    2.3220      1.7260

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     32.777     4.785      1.42      48.76
   OUTFLOW: ID= 1 (  5512)     32.777     0.972      2.42      48.70

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.31
                  TIME SHIFT OF PEAK FLOW          (min)= 60.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.0834
```

```
--------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   5.372     2.58    37.51
     + ID2= 2 (  0515):     5.01   0.265     1.83    25.50
       ================================================
       ID = 3 (  2514):   162.24   5.504     2.58    37.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   5.504     2.58    37.14
     + ID2= 2 (  5512):    32.78   0.972     2.42    48.70
       ================================================
       ID = 1 (  2514):   195.02   6.459     2.58    39.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0058)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.579 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.940
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.374

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2514):   195.02   6.459     2.58    39.09
     + ID2= 2 (  4400):   264.84   7.701     2.31    29.52
       ================================================
       ID = 3 (  2513):   459.86  14.074     2.42    33.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   459.86  14.074     2.42    33.45
     + ID2= 2 (  0058):     6.68   0.579     1.58    27.94
       ================================================
       ID = 1 (  2513):   466.54  14.212     2.42    33.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.20

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   3.015 (i)
     TIME TO PEAK    (hrs)=   2.917
     RUNOFF VOLUME    (mm)=  27.993
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.375

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   466.54  14.212     2.42    33.37
     + ID2= 2 (  0520):   108.36   3.015     2.92    27.99
       ================================================
       ID = 3 (  2520):   574.90  16.962     2.50    32.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         409.70        0.0550
                 19.70         408.80        0.0550
                 41.70         407.20        0.0550
                 60.50         405.30        0.0550
                 80.00         404.50        0.0550
                 95.70         404.60    0.0550 /0.0350  Main Channel
                 98.60         403.40        0.0350      Main Channel
                100.40         403.40        0.0350      Main Channel
                100.80         402.90        0.0350      Main Channel
                101.50         402.70        0.0350      Main Channel
                102.30         402.80        0.0350      Main Channel
                103.30         403.20        0.0350      Main Channel
                104.00         403.20        0.0350      Main Channel
                105.60         404.40    0.0350 /0.0550  Main Channel
                109.70         404.30        0.0550
                128.60         404.20        0.0550
                154.10         405.40        0.0550
                179.10         406.70        0.0550
                201.90         408.60        0.0550
                224.20         410.60        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.34   403.04    .954E+03       0.3          0.70      47.40
```

```
       0.68   403.38    .304E+04       1.6          1.03      32.27
       1.02   403.72    .718E+04       4.5          1.25      26.57
       1.36   404.06    .122E+05       9.7          1.58      20.96
       1.70   404.40    .251E+05      18.1          1.44      23.04
       2.08   404.78    .650E+05      42.3          1.29      25.62
       2.46   405.16    .122E+06      86.3          1.40      23.62
       2.84   405.54    .192E+06     151.6          1.57      21.10
       3.21   405.91    .270E+06     238.3          1.75      18.90
       3.59   406.29    .357E+06     345.8          1.93      17.20
       3.97   406.67    .452E+06     474.9          2.09      15.85
       4.35   407.05    .554E+06     631.1          2.26      14.63
       4.73   407.43    .663E+06     807.8          2.42      13.67
       5.11   407.81    .779E+06    1006.4          2.57      12.89
       5.49   408.19    .902E+06    1229.0          2.71      12.23
       5.86   408.56    .103E+07    1476.4          2.84      11.66
       6.24   408.94    .117E+07    1745.6          2.96      11.18
       6.62   409.32    .132E+07    2034.5          3.07      10.79
       7.00   409.70    .147E+07    2353.2          3.17      10.44

                                 <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2520)  574.90    16.96    2.50  32.36      1.65      1.46
   OUTFLOW: ID= 1 (  4500)  574.90    15.87    3.00  32.35      1.60      1.48


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   2.489 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  27.993
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.375

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  4500):   574.90  15.866     3.00    32.35
      + ID2= 2 (  0610):    78.05   2.489     2.67    27.99
        ================================================
        ID = 3 (  2610):   652.95  18.213     2.94    31.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.396 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  27.188
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.594 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  27.187
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   1.037 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  27.190
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.585 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  27.191
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
```

```
| CALIB             |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.393 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  27.188
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0360      Main Channel
                   4.30        412.70        0.0360      Main Channel
                   8.60        414.20        0.0360      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .108E+02       0.0          0.24      42.13
       0.16   412.86    .434E+02       0.0          0.38      26.54
       0.24   412.94    .976E+02       0.1          0.50      20.26
       0.32   413.02    .174E+03       0.2          0.61      16.72
       0.39   413.09    .271E+03       0.3          0.70      14.41
       0.47   413.17    .390E+03       0.5          0.79      12.76
       0.55   413.25    .532E+03       0.8          0.88      11.51
       0.63   413.33    .694E+03       1.1          0.96      10.53
       0.71   413.41    .879E+03       1.5          1.04       9.74
       0.79   413.49    .108E+04       2.0          1.11       9.08
       0.87   413.57    .131E+04       2.6          1.19       8.52
       0.95   413.65    .156E+04       3.2          1.26       8.04
       1.03   413.73    .183E+04       4.0          1.33       7.62
       1.11   413.81    .213E+04       4.9          1.39       7.25
       1.18   413.88    .244E+04       5.9          1.46       6.93
       1.26   413.96    .278E+04       7.0          1.52       6.64
       1.34   414.04    .313E+04       8.2          1.59       6.37
       1.42   414.12    .351E+04       9.5          1.65       6.13
       1.50   414.20    .392E+04      11.0          1.71       5.92

                                 <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0625)    6.72     0.39    1.83  27.19      0.43      0.74
   OUTFLOW: ID= 1 (  4625)    6.72     0.35    2.08  27.15      0.41      0.72

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------
```

```
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.64         0.42
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      84.06        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        76.95
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       1.86 (ii)    9.70 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.06          0.275 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      73.68        33.62          53.64
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.45           0.72

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.349     2.08    27.15
     + ID2= 2 (  0621):     6.56   0.396     1.83    27.19
       ================================================
       ID = 3 (  2625):    13.28   0.715     1.92    27.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    13.28   0.715     1.92    27.17
     + ID2= 2 (  0622):     9.69   0.594     1.83    27.19
       ================================================
       ID = 1 (  2625):    22.97   1.291     1.92    27.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    22.97   1.291     1.92    27.18
     + ID2= 2 (  0623):    19.37   1.037     1.92    27.19
       ================================================
       ID = 3 (  2625):    42.34   2.328     1.92    27.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    42.34   2.328     1.92    27.18
     + ID2= 2 (  0624):    11.84   0.585     2.00    27.19
       ================================================
       ID = 1 (  2625):    54.18   2.902     1.92    27.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    54.18   2.902     1.92    27.18
     + ID2= 2 (  0626):     1.06   0.275     1.33    53.64
       ================================================
       ID = 3 (  2625):    55.24   2.959     1.92    27.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.788 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.140
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99       305.25
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.64 (ii)    2.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.30
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.07          0.335 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      74.16        51.21          67.27
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.69           0.90

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99       107.08
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.97 (ii)    7.83 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.37         0.17          0.459 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      74.16        37.76          52.32
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.51           0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.459     1.33    52.32
     + ID2= 2 (  6240):     0.79   0.335     1.33    67.27
       ================================================
       ID = 3 ( 26240):     2.75   0.794     1.33    56.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000     0.0000   |    0.1390      0.0686
```

0.0060	0.0042	|	0.1510	0.0822
0.0130	0.0130	|	0.1630	0.0967
0.0200	0.0250	|	0.1730	0.1121
0.0250	0.0328	|	0.1780	0.1202
0.0290	0.0439	|	2.5750	0.1742
0.1260	0.0558	|	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (26240)	2.750	0.794	1.33	56.61
OUTFLOW: ID= 1 (46240)	2.750	0.155	1.92	56.55

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.45
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.0865

CALIB		
STANDHYD (6220)	Area (ha)=	0.92
ID= 1 DT= 5.0 min	Total Imp(%)=	40.00 Dir. Conn.(%)= 20.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.37	0.55	
Dep. Storage	(mm)=	0.52	7.16	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	40.00	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		170.99	87.70	
over (min)		5.00	10.00	
Storage Coeff. (min)=		0.97 (ii)	8.40 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.34	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.09	0.10	0.142 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.42
RUNOFF VOLUME	(mm)=	74.16	35.26	43.03
TOTAL RAINFALL	(mm)=	74.68	74.68	74.68
RUNOFF COEFFICIENT	=	0.99	0.47	0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(46220)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.2590	0.0708
	0.0050	0.0089	0.2910	0.0871
	0.0100	0.0187	0.3210	0.1045
	0.0130	0.0298	0.3720	0.1438
	0.0150	0.0422	2.8080	0.2087
	0.2220	0.0559	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (6220)	0.920	0.142	1.42	43.03
OUTFLOW: ID= 1 (46220)	0.920	0.013	2.83	42.55

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.06
TIME SHIFT OF PEAK FLOW (min)= 85.00
MAXIMUM STORAGE USED (ha.m.)= 0.0294

CALIB		
STANDHYD (6230)	Area (ha)=	0.48
ID= 1 DT= 5.0 min	Total Imp(%)=	10.00 Dir. Conn.(%)= 5.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.05	0.43	
Dep. Storage	(mm)=	0.52	7.16	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	20.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		170.99	57.71	
over (min)		5.00	10.00	
Storage Coeff. (min)=		0.64 (ii)	6.44 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.34	0.14	
				TOTALS
PEAK FLOW	(cms)=	0.01	0.05	0.058 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.50
RUNOFF VOLUME	(mm)=	74.16	30.24	32.42
TOTAL RAINFALL	(mm)=	74.68	74.68	74.68
RUNOFF COEFFICIENT	=	0.99	0.40	0.43

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0004)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (46220):	0.92	0.013	2.83	42.55
	+ ID2= 2 (46240):	2.75	0.155	1.92	56.55
	ID = 3 (0004):	3.67	0.166	1.92	53.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
       ID1= 3 (  0004):     3.67   0.166     1.92    53.04
     + ID2= 2 (  6230):     0.48   0.058     1.50    32.42
       ================================================
       ID = 1 (  0004):     4.15   0.205     1.58    50.66

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

     <---------- TRAVEL TIME TABLE ---------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .456E+01       0.0          0.55       7.70
      0.16   412.86    .182E+02       0.1          0.88       4.85
      0.24   412.94    .410E+02       0.2          1.15       3.70
      0.32   413.02    .729E+02       0.4          1.39       3.05
      0.39   413.09    .114E+03       0.7          1.61       2.63
      0.47   413.17    .164E+03       1.2          1.82       2.33
      0.55   413.25    .223E+03       1.8          2.02       2.10
      0.63   413.33    .292E+03       2.5          2.21       1.92
      0.71   413.41    .369E+03       3.5          2.39       1.78
      0.79   413.49    .456E+03       4.6          2.56       1.66
      0.87   413.57    .551E+03       5.9          2.73       1.56
      0.95   413.65    .656E+03       7.4          2.89       1.47
      1.03   413.73    .770E+03       9.2          3.05       1.39
      1.11   413.81    .893E+03      11.2          3.21       1.32
      1.18   413.88    .103E+04      13.5          3.36       1.27
      1.26   413.96    .117E+04      16.0          3.51       1.21
      1.34   414.04    .132E+04      18.9          3.65       1.16
      1.42   414.12    .148E+04      22.0          3.79       1.12
      1.50   414.20    .165E+04      25.4          3.93       1.08

                              <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0004)    4.15     0.21    1.58  50.66      0.24      1.17
   OUTFLOW: ID= 1 (  4620)    4.15     0.20    1.64  50.34      0.24      1.16



--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0117)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    55.24   2.959     1.92    27.69
     + ID2= 2 (  4620):     4.15   0.203     1.64    50.34
       ================================================
       ID = 3 (  0117):    59.39   3.150     1.92    29.28

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0117)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0117):    59.39   3.150     1.92    29.28
     + ID2= 2 (  0627):     9.39   0.788     1.58    27.14
       ================================================
       ID = 1 (  0117):    68.78   3.680     1.83    28.98

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0116)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0117):    68.78   3.680     1.83    28.98
     + ID2= 2 (  2610):   652.95  18.213     2.94    31.83
       ================================================
       ID = 3 (  0116):   721.73  19.630     2.83    31.56

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

    Unit Hyd Qpeak  (cms)=   0.679

    PEAK FLOW       (cms)=   0.434 (i)
    TIME TO PEAK    (hrs)=   2.000
    RUNOFF VOLUME    (mm)=  27.190
    TOTAL RAINFALL   (mm)=  74.676
    RUNOFF COEFFICIENT   =   0.364

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38

    Unit Hyd Qpeak  (cms)=   3.321

    PEAK FLOW       (cms)=   1.963 (i)
    TIME TO PEAK    (hrs)=   1.833
    RUNOFF VOLUME    (mm)=  27.188
    TOTAL RAINFALL   (mm)=  74.676
    RUNOFF COEFFICIENT   =   0.364

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
```

```
                4.30        412.70        0.0350      Main Channel
                8.60        414.20        0.0350      Main Channel

     <---------- TRAVEL TIME TABLE ---------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)       (m/s)      (min)
      0.08   412.78    .893E+01       0.0         0.17      47.72
      0.16   412.86    .357E+02       0.0         0.28      30.06
      0.24   412.94    .804E+02       0.1         0.36      22.94
      0.32   413.02    .143E+03       0.1         0.44      18.94
      0.39   413.09    .223E+03       0.2         0.51      16.32
      0.47   413.17    .322E+03       0.4         0.58      14.45
      0.55   413.25    .438E+03       0.6         0.64      13.04
      0.63   413.33    .572E+03       0.8         0.70      11.93
      0.71   413.41    .724E+03       1.1         0.76      11.03
      0.79   413.49    .893E+03       1.4         0.81      10.28
      0.87   413.57    .108E+04       1.9         0.86       9.65
      0.95   413.65    .129E+04       2.4         0.92       9.10
      1.03   413.73    .151E+04       2.9         0.97       8.63
      1.11   413.81    .175E+04       3.6         1.01       8.22
      1.18   413.88    .201E+04       4.3         1.06       7.85
      1.26   413.96    .229E+04       5.1         1.11       7.52
      1.34   414.04    .258E+04       6.0         1.15       7.22
      1.42   414.12    .289E+04       6.9         1.20       6.95
      1.50   414.20    .323E+04       8.0         1.24       6.70

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     1.96    1.83  27.19      0.88      0.87
   OUTFLOW: ID= 1 (  4630)   33.04     1.83    2.00  27.18      0.86      0.86



--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0116):    721.73  19.630     2.83    31.56
     + ID2= 2 (  4630):     33.04   1.829     2.00    27.18
       ==================================================
       ID = 3 (  2637):    754.77  20.486     2.69    31.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):    754.77  20.486     2.69    31.37
     + ID2= 2 (  0637):      8.36   0.434     2.00    27.19
       ==================================================
       ID = 1 (  2637):    763.13  20.719     2.69    31.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.170 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  27.190
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):    763.13  20.719     2.69    31.32
     + ID2= 2 (  0636):      3.32   0.170     2.00    27.19
       ==================================================
       ID = 3 (  2636):    766.45  20.815     2.67    31.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.46

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   1.087 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  27.190
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.253 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  27.190
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   766.45  20.815     2.67    31.30
     + ID2= 2 (  0638):    20.63   1.087     1.92    27.19
       ================================================
       ID = 3 (  2630):   787.08  21.424     2.61    31.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   787.08  21.424     2.61    31.19
     + ID2= 2 (  0639):     4.60   0.253     1.92    27.19
       ================================================
       ID = 1 (  2630):   791.68  21.557     2.58    31.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0709)|   Area    (ha)=  21.19   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.65

     Unit Hyd Qpeak  (cms)=   1.245

     PEAK FLOW       (cms)=   0.891 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  27.192
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

 FINISH
================================================================================================================
--------------------
  ***********************************************
  ** SIMULATION : 50 year Fergus Shand Dam Chic **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=3574.000
| Ptotal= 84.43 mm |                          B=  19.000
--------------------                          C=   0.924
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.36 |  1.00   29.13 |  2.00   15.89 |  3.00    5.24
                0.08    3.68 |  1.08   47.79 |  2.08   13.89 |  3.08    4.93
                0.17    4.06 |  1.17   98.38 |  2.17   12.28 |  3.17    4.65
                0.25    4.51 |  1.25  189.90 |  2.25   10.96 |  3.25    4.40
                0.33    5.08 |  1.33  119.63 |  2.33    9.87 |  3.33    4.17
                0.42    5.77 |  1.42   77.23 |  2.42    8.95 |  3.42    3.96
                0.50    6.66 |  1.50   54.63 |  2.50    8.18 |  3.50    3.77
                0.58    7.83 |  1.58   41.06 |  2.58    7.51 |  3.58    3.60
                0.67    9.40 |  1.67   32.23 |  2.67    6.93 |  3.67    3.44
                0.75   11.60 |  1.75   26.13 |  2.75    6.42 |  3.75    3.29
                0.83   14.86 |  1.83   21.72 |  2.83    5.98 |  3.83    3.15
                0.92   20.04 |  1.92   18.43 |  2.92    5.59 |  3.92    3.03

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   4.537 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  32.598
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.386

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.690 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=  39.944
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.473

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.81 (ii)    6.90 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.08         0.99          1.639 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
```

```
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.80
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.690     2.58    39.94
     + ID2= 2 (  0203):     8.20   1.639     1.42    51.80
       ================================================
       ID = 3 (  2200):    22.80   1.706     1.42    44.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1980      0.2314
                          0.0040      0.0218   |    0.2920      0.2621
                          0.0060      0.0446   |    0.3980      0.2937
                          0.0070      0.0683   |    0.5150      0.3261
                          0.0080      0.0930   |    0.8290      0.3592
                          0.0090      0.1187   |    1.3520      0.3930
                          0.0230      0.1453   |    2.0570      0.4275
                          0.0610      0.1730   |    2.9590      0.4629
                          0.1200      0.2017   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.706      1.42      44.21
   OUTFLOW: ID= 1 (  5200)     22.800      0.840      2.67      44.15

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 49.23
                  TIME SHIFT OF PEAK FLOW         (min)= 75.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3599

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.668 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  61.867
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.733

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.81 (ii)    6.90 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.040 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.77
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.668     1.83    61.87
     + ID2= 2 (  0206):     0.20   0.040     1.42    51.77
       ================================================
       ID = 3 (  2201):     5.00   0.683     1.83    61.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.683     1.83    61.46
     + ID2= 2 (  5200):    22.80   0.840     2.67    44.15
       ================================================
       ID = 1 (  2201):    27.80   1.195     2.25    47.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

```
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        72.28
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.00 (ii)    9.64 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.31          0.358 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.43        36.53          40.20
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.43           0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.81 (ii)    6.90 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.16          0.260 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.80
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.260     1.42    51.80
     + ID2= 2 (  0209):     2.70   0.358     1.50    40.20
       ================================================
       ID = 3 (  2202):     4.00   0.610     1.42    43.97

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.610     1.42    43.97
     + ID2= 2 (  2201):    27.80   1.195     2.25    47.26
       ================================================
       ID = 1 (  2202):    31.80   1.368     1.83    46.85

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   4.537     2.83    32.60
     + ID2= 2 (  2202):    31.80   1.368     1.83    46.85
       ================================================
       ID = 3 (  2100):   168.78   5.637     2.75    35.28

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.234 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  39.941
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.473

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
```

```
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.86 (ii)    7.29 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.58         0.53          0.867 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.80
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.234     1.92    39.94
     + ID2= 2 (  0304):     4.40   0.867     1.42    51.80
       ================================================
       ID = 3 (  2300):     7.30   0.941     1.42    47.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       104.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.86 (ii)    7.29 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.039 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.78
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        72.28
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.81 (ii)    7.88 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.71          0.803 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.50
     RUNOFF VOLUME    (mm)=      82.43        36.53          40.20
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.43           0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.941     1.42    47.09
     + ID2= 2 (  0308):     0.20   0.039     1.42    51.78
       ================================================
       ID = 3 (  2301):     7.50   0.980     1.42    47.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.980     1.42    47.21
     + ID2= 2 (  0310):     5.70   0.803     1.50    40.20
       ================================================
```

```
        ID = 1 (  2301):    13.20   1.782     1.42    44.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   5.637     2.75    35.28
     + ID2= 2 (  2301):    13.20   1.782     1.42    44.19
       ================================================
       ID = 3 (  2302):   181.98   5.927     2.67    35.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      8.29        74.57
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      0.70         2.00
     Length            (m)=   1437.00        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    154.76        68.11
               over (min)      10.00        25.00
     Storage Coeff.  (min)=    11.81 (ii)   20.04 (ii)
     Unit Hyd. Tpeak (min)=    10.00        25.00
     Unit Hyd. peak  (cms)=     0.10         0.05
                                                        *TOTALS*
     PEAK FLOW       (cms)=     0.71         6.64          7.075 (iii)
     TIME TO PEAK    (hrs)=     1.42         1.75           1.75
     RUNOFF VOLUME    (mm)=    82.43        35.21          36.63
     TOTAL RAINFALL   (mm)=    84.43        84.43          84.43
     RUNOFF COEFFICIENT   =     0.98         0.42           0.43

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   5.927     2.67    35.93
     + ID2= 2 (  0400):    82.86   7.075     1.75    36.63
       ================================================
       ID = 3 (  2400):   264.84  11.170     1.83    36.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                   0.00         411.10        0.0550
                  27.30         410.20        0.0550
                  77.50         409.10        0.0550
                  96.60         409.10        0.0550
                 115.80         408.90        0.0550
                 124.80         409.10        0.0550
                 131.00         408.90    0.0550 /0.0350  Main Channel
                 133.60         408.00        0.0350      Main Channel
                 134.40         407.60        0.0350      Main Channel
                 135.00         407.50        0.0350      Main Channel
                 135.80         407.60        0.0350      Main Channel
                 136.50         408.00        0.0350      Main Channel
                 139.40         408.80    0.0350 /0.0550  Main Channel
                 143.50         408.90        0.0550
                 148.50         408.70        0.0550
                 163.80         408.90        0.0550
                 183.20         408.90        0.0550
                 243.70         409.70        0.0550
                 278.70         410.20        0.0550
                 330.50         411.40        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)        (m/s)       (min)
       0.19   407.69    .366E+03         0.1         0.51       58.83
       0.37   407.87    .106E+04         0.5         0.81       37.08
       0.56   408.06    .199E+04         1.1         1.00       29.93
       0.74   408.24    .328E+04         2.1         1.14       26.32
       0.93   408.43    .498E+04         3.6         1.28       23.32
       1.11   408.61    .708E+04         5.6         1.43       20.94
       1.30   408.80    .105E+05         8.5         1.45       20.61
       1.49   408.99    .247E+05        14.8         1.07       27.91
       1.68   409.18    .601E+05        30.4         0.91       32.97
       1.87   409.37    .109E+06        58.5         0.96       31.05
       2.06   409.56    .166E+06        98.3         1.06       28.11
       2.25   409.75    .231E+06       150.3         1.17       25.57
       2.44   409.94    .303E+06       215.4         1.28       23.46
       2.64   410.14    .383E+06       293.8         1.38       21.74
       2.83   410.33    .470E+06       390.1         1.49       20.10
       3.02   410.52    .563E+06       502.4         1.60       18.66
       3.21   410.71    .660E+06       628.8         1.71       17.48
       3.40   410.90    .762E+06       769.5         1.81       16.49
       3.59   411.09    .868E+06       924.9         1.91       15.65

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  2400)  264.84    11.17    1.83  36.15      1.38      1.26
  OUTFLOW: ID= 1 (  4400)  264.84     9.54    2.42  36.07      1.33      1.37


    **** WARNING : THE HYD WAS CUT TO 2000 POINTS

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
```

```
--------------------  U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.328 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  31.300
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.371

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   1.09

     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   3.635 (i)
     TIME TO PEAK    (hrs)=   2.750
     RUNOFF VOLUME    (mm)=  36.841
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.436

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .206E+02       0.0         0.19      101.61
        0.16   412.86    .822E+02       0.0         0.30       64.01
        0.24   412.94    .185E+03       0.1         0.39       48.85
        0.32   413.02    .329E+03       0.1         0.48       40.33
        0.39   413.09    .514E+03       0.2         0.55       34.75
        0.47   413.17    .740E+03       0.4         0.62       30.77
        0.55   413.25    .101E+04       0.6         0.69       27.77
        0.63   413.33    .132E+04       0.9         0.75       25.40
        0.71   413.41    .166E+04       1.2         0.82       23.48
        0.79   413.49    .206E+04       1.6         0.88       21.89
        0.87   413.57    .249E+04       2.0         0.93       20.54
        0.95   413.65    .296E+04       2.5         0.99       19.39
        1.03   413.73    .347E+04       3.1         1.04       18.38
        1.11   413.81    .403E+04       3.8         1.10       17.49
        1.18   413.88    .462E+04       4.6         1.15       16.71
        1.26   413.96    .526E+04       5.5         1.20       16.00
        1.34   414.04    .594E+04       6.4         1.25       15.37
        1.42   414.12    .666E+04       7.5         1.30       14.79
        1.50   414.20    .742E+04       8.7         1.34       14.27
```

```
                                  <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0510)   91.44     3.64    2.75  36.84      1.08      1.08
   OUTFLOW: ID= 1 (  4510)   91.44     3.48    3.00  36.84      1.06      1.07


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.194 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  36.830
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.436

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43         26.43
     Dep. Storage     (mm)=       0.80          1.50
     Average Slope     (%)=       1.00          1.00
     Length            (m)=     593.69         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     189.90        114.36
               over (min)         5.00         15.00
     Storage Coeff.  (min)=       5.76 (ii)    13.99 (ii)
     Unit Hyd. Tpeak (min)=       5.00         15.00
     Unit Hyd. peak  (cms)=       0.20          0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       6.21          4.85          8.838 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.58          1.50
     RUNOFF VOLUME    (mm)=      83.63         44.13         55.98
     TOTAL RAINFALL   (mm)=      84.43         84.43         84.43
     RUNOFF COEFFICIENT   =       0.99          0.52          0.66


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
--------------------
```

```
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        58.24
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       3.57 (ii)   14.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       2.21         0.62          2.415 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      83.63        36.84          57.90
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.44           0.69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0511):    52.87   8.838     1.50    55.98
      + ID2= 2 (  0516):    10.78   2.415     1.33    57.90
        ================================================
        ID = 3 (  2511):    63.65  10.942     1.42    56.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.7700      0.9000   |    3.2130      1.6220
                          1.6000      1.1400   |    3.9540      1.8810
                          2.2900      1.2810   |    4.9000      2.3000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650    10.942      1.42      56.30
   OUTFLOW: ID= 1 (  4511)     63.650     3.893      2.08      56.30

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 35.58
                  TIME SHIFT OF PEAK FLOW        (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.8626

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  4510):    91.44   3.482     3.00    36.84
      + ID2= 2 (  4511):    63.65   3.893     2.08    56.30
        ================================================
        ID = 3 (  2510):   155.09   6.454     2.58    44.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2510):   155.09   6.454     2.58    44.82
      + ID2= 2 (  0517):     2.14   0.194     1.75    36.83
        ================================================
        ID = 1 (  2510):   157.23   6.517     2.58    44.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       114.36
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       4.71 (ii)   11.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.22         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       3.42         2.70          4.753 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.42
     RUNOFF VOLUME    (mm)=      83.63        44.13          55.98
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.52           0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
```

```
     Length           (m)=     207.20        40.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       175.96
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.06 (ii)    9.99 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.06         0.75          1.507 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      83.63        50.13          61.86
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.59           0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      1.51      1.42   61.86
     ==================================================
     MAJOR SYS.(ID= 2):   1.24      0.78      1.42   61.86
     MINOR SYS.(ID= 3):   5.20      0.73      1.33   61.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0512):    27.13   4.753     1.42    55.98
      + ID2= 2 (  8512):     5.20   0.732     1.33    61.86
        ================================================
        ID = 3 (  2512):    32.33   5.485     1.42    56.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.6640      0.9151
                          0.0210      0.1601  |    0.8570      1.0220
                          0.0360      0.3317  |    1.0660      1.1320
                          0.0410      0.4218  |    1.2900      1.2450
                          0.1000      0.5147  |    1.5290      1.3610
                          0.2030      0.6105  |    1.7810      1.4800
                          0.3340      0.7092  |    2.0460      1.6020
                          0.4890      0.8107  |    2.3220      1.7260

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     32.335      5.485      1.42      56.92
   OUTFLOW: ID= 1 (  5512)     32.335      1.229      2.33      56.87

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.40
                  TIME SHIFT OF PEAK FLOW         (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.2149

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2510):   157.23   6.517     2.58    44.71
      + ID2= 2 (  0515):     5.01   0.328     1.83    31.30
        ================================================
        ID = 3 (  2514):   162.24   6.678     2.58    44.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2514):   162.24   6.678     2.58    44.30
      + ID2= 2 (  5512):    32.33   1.229     2.33    56.87
        ================================================
        ID = 1 (  2514):   194.57   7.884     2.50    46.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0058)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.718 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  34.377
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.407

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2514):   194.57   7.884     2.50    46.39
      + ID2= 2 (  4400):   264.84   9.537     2.42    36.07
        ================================================
        ID = 3 (  2513):   459.41  17.398     2.44    40.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   459.41  17.398     2.44    40.31
     + ID2= 2 (  0058):     6.68   0.718     1.58    34.38
       ================================================
       ID = 1 (  2513):   466.09  17.564     2.42    40.22

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.20

    Unit Hyd Qpeak  (cms)=   3.449

    PEAK FLOW       (cms)=   3.730 (i)
    TIME TO PEAK    (hrs)=   2.833
    RUNOFF VOLUME    (mm)=  34.443
    TOTAL RAINFALL   (mm)=  84.430
    RUNOFF COEFFICIENT   =   0.408

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   466.09  17.564     2.42    40.22
     + ID2= 2 (  0520):   108.36   3.730     2.83    34.44
       ================================================
       ID = 3 (  2520):   574.45  21.008     2.50    39.13

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 0.00         409.70        0.0550
                19.70         408.80        0.0550
                41.70         407.20        0.0550
                60.50         405.30        0.0550
                80.00         404.50        0.0550
                95.70         404.60    0.0550 /0.0350  Main Channel
                98.60         403.40        0.0350      Main Channel
               100.40         403.40        0.0350      Main Channel
               100.80         402.90        0.0350      Main Channel
               101.50         402.70        0.0350      Main Channel
               102.30         402.80        0.0350      Main Channel
               103.30         403.20        0.0350      Main Channel
               104.00         403.20        0.0350      Main Channel
               105.60         404.40    0.0350 /0.0550  Main Channel
               109.70         404.30        0.0550
               128.60         404.20        0.0550
               154.10         405.40        0.0550
               179.10         406.70        0.0550
               201.90         408.60        0.0550
               224.20         410.60        0.0550

     <---------- TRAVEL TIME TABLE ---------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.34   403.04    .954E+03       0.3         0.70       47.40
      0.68   403.38    .304E+04       1.6         1.03       32.27
      1.02   403.72    .718E+04       4.5         1.25       26.57
      1.36   404.06    .122E+05       9.7         1.58       20.96
      1.70   404.40    .251E+05      18.1         1.44       23.04
      2.08   404.78    .650E+05      42.3         1.29       25.62
      2.46   405.16    .122E+06      86.3         1.40       23.62
      2.84   405.54    .192E+06     151.6         1.57       21.10
      3.21   405.91    .270E+06     238.3         1.75       18.90
      3.59   406.29    .357E+06     345.8         1.93       17.20
      3.97   406.67    .452E+06     474.9         2.09       15.85
      4.35   407.05    .554E+06     631.1         2.26       14.63
      4.73   407.43    .663E+06     807.8         2.42       13.67
      5.11   407.81    .779E+06    1006.4         2.57       12.89
      5.49   408.19    .902E+06    1229.0         2.71       12.23
      5.86   408.56    .103E+07    1476.4         2.84       11.66
      6.24   408.94    .117E+07    1745.6         2.96       11.18
      6.62   409.32    .132E+07    2034.5         3.07       10.79
      7.00   409.70    .147E+07    2353.2         3.17       10.44
```

```
                                <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
  INFLOW : ID= 2 (  2520)  574.45    21.01    2.50  39.13      1.75       1.42
  OUTFLOW: ID= 1 (  4500)  574.45    19.52    3.00  39.13      1.72       1.43
```

```
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

    Unit Hyd Qpeak  (cms)=   2.981

    PEAK FLOW       (cms)=   3.080 (i)
    TIME TO PEAK    (hrs)=   2.583
    RUNOFF VOLUME    (mm)=  34.443
    TOTAL RAINFALL   (mm)=  84.430
    RUNOFF COEFFICIENT   =   0.408

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   574.45  19.520     3.00    39.13
     + ID2= 2 (  0610):    78.05   3.080     2.58    34.44
       ================================================
```

```
        ID = 3 (  2610):   652.50  22.413     2.94    38.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37

     Unit Hyd Qpeak  (cms)=   0.677

     PEAK FLOW       (cms)=   0.492 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.502
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36

     Unit Hyd Qpeak  (cms)=   1.028

     PEAK FLOW       (cms)=   0.737 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.502
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   1.644

     PEAK FLOW       (cms)=   1.288 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  33.506
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.727 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  33.507
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.488 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.503
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0360      Main Channel
                   4.30        412.70        0.0360      Main Channel
                   8.60        414.20        0.0360      Main Channel

          <---------------------- TRAVEL TIME TABLE ---------------------->
           DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
            (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
           0.08   412.78    .108E+02       0.0          0.24      42.13
           0.16   412.86    .434E+02       0.0          0.38      26.54
           0.24   412.94    .976E+02       0.1          0.50      20.26
           0.32   413.02    .174E+03       0.2          0.61      16.72
           0.39   413.09    .271E+03       0.3          0.70      14.41
           0.47   413.17    .390E+03       0.5          0.79      12.76
           0.55   413.25    .532E+03       0.8          0.88      11.51
           0.63   413.33    .694E+03       1.1          0.96      10.53
           0.71   413.41    .879E+03       1.5          1.04       9.74
           0.79   413.49    .108E+04       2.0          1.11       9.08
           0.87   413.57    .131E+04       2.6          1.19       8.52
           0.95   413.65    .156E+04       3.2          1.26       8.04
           1.03   413.73    .183E+04       4.0          1.33       7.62
           1.11   413.81    .213E+04       4.9          1.39       7.25
           1.18   413.88    .244E+04       5.9          1.46       6.93
           1.26   413.96    .278E+04       7.0          1.52       6.64
           1.34   414.04    .313E+04       8.2          1.59       6.37
           1.42   414.12    .351E+04       9.5          1.65       6.13
           1.50   414.20    .392E+04      11.0          1.71       5.92

                                     <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0625)    6.72     0.49    1.83  33.50      0.46      0.78
```

```
   OUTFLOW: ID= 1 (  4625)    6.72     0.44    2.08  33.47      0.44      0.76



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.64         0.42
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      84.06        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        92.87
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.78 (ii)    6.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.08          0.319 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      83.43        40.67          62.05
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.48           0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  4625):     6.72   0.436     2.08    33.47
      + ID2= 2 (  0621):     6.56   0.492     1.83    33.50
        ================================================
        ID = 3 (  2625):    13.28   0.896     1.92    33.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2625):    13.28   0.896     1.92    33.49
      + ID2= 2 (  0622):     9.69   0.737     1.83    33.50
        ================================================
        ID = 1 (  2625):    22.97   1.610     1.92    33.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2625):    22.97   1.610     1.92    33.49
      + ID2= 2 (  0623):    19.37   1.288     1.92    33.51
        ================================================
        ID = 3 (  2625):    42.34   2.898     1.92    33.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2625):    42.34   2.898     1.92    33.50
      + ID2= 2 (  0624):    11.84   0.727     2.00    33.51
        ================================================
        ID = 1 (  2625):    54.18   3.612     1.92    33.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2625):    54.18   3.612     1.92    33.50
      + ID2= 2 (  0626):     1.06   0.319     1.33    62.05
        ================================================
        ID = 3 (  2625):    55.24   3.675     1.92    34.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.978 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  33.444
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250
```

```
     Max.Eff.Inten.(mm/hr)=     189.90       356.02
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.61 (ii)    2.27 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.09          0.377 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      83.91        60.21         76.80
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.71          0.91

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       129.27
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    7.30 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.41         0.21          0.527 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      83.91        45.60         60.92
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.54          0.72

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.527     1.33    60.92
     + ID2= 2 (  6240):     0.79   0.377     1.33    76.80
       ================================================
       ID = 3 ( 26240):     2.75   0.904     1.33    65.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.1390      0.0686
                           0.0060      0.0042   |    0.1510      0.0822
                           0.0130      0.0130   |    0.1630      0.0967
                           0.0200      0.0250   |    0.1730      0.1121
                           0.0250      0.0328   |    0.1780      0.1202
                           0.0290      0.0439   |    2.5750      0.1742
                           0.1260      0.0558   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)      2.750     0.904      1.33      65.48
   OUTFLOW: ID= 1 ( 46240)      2.750     0.167      1.92      65.42

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.48
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1030

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       106.62
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    7.81 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.12          0.173 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      83.91        42.81         51.03
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.51          0.60

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
```

```
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.2590      0.0708
                          0.0050      0.0089  |    0.2910      0.0871
                          0.0100      0.0187  |    0.3210      0.1045
                          0.0130      0.0298  |    0.3720      0.1438
                          0.0150      0.0422  |    2.8080      0.2087
                          0.2220      0.0559  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)     0.920     0.173      1.42      51.03
   OUTFLOW: ID= 1 ( 46220)     0.920     0.014      2.92      50.54

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.04
                  TIME SHIFT OF PEAK FLOW        (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0355

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05         0.43
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        71.26
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.61 (ii)    5.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.07          0.073 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      83.91        37.17         39.50
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.44          0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.014     2.92    50.54
     + ID2= 2 ( 46240):     2.75   0.167     1.92    65.42
       ================================================
       ID = 3 (  0004):     3.67   0.180     2.00    61.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):     3.67   0.180     2.00    61.69
     + ID2= 2 (  6230):     0.48   0.073     1.42    39.50
       ================================================
       ID = 1 (  0004):     4.15   0.230     1.50    59.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         414.20        0.0350      Main Channel
                  4.30         412.70        0.0350      Main Channel
                  8.60         414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)    (cu.m.)      (cms)        (m/s)       (min)
       0.08   412.78    .456E+01       0.0         0.55        7.70
       0.16   412.86    .182E+02       0.1         0.88        4.85
       0.24   412.94    .410E+02       0.2         1.15        3.70
       0.32   413.02    .729E+02       0.4         1.39        3.05
       0.39   413.09    .114E+03       0.7         1.61        2.63
       0.47   413.17    .164E+03       1.2         1.82        2.33
       0.55   413.25    .223E+03       1.8         2.02        2.10
       0.63   413.33    .292E+03       2.5         2.21        1.92
       0.71   413.41    .369E+03       3.5         2.39        1.78
       0.79   413.49    .456E+03       4.6         2.56        1.66
       0.87   413.57    .551E+03       5.9         2.73        1.56
       0.95   413.65    .656E+03       7.4         2.89        1.47
       1.03   413.73    .770E+03       9.2         3.05        1.39
       1.11   413.81    .893E+03      11.2         3.21        1.32
       1.18   413.88    .103E+04      13.5         3.36        1.27
       1.26   413.96    .117E+04      16.0         3.51        1.21
       1.34   414.04    .132E+04      18.9         3.65        1.16
       1.42   414.12    .148E+04      22.0         3.79        1.12
       1.50   414.20    .165E+04      25.4         3.93        1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0004)    4.15     0.23    1.50  59.12      0.25      1.19
   OUTFLOW: ID= 1 (  4620)    4.15     0.23    1.61  58.81      0.25      1.19

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0117)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    55.24   3.675     1.92    34.05
     + ID2= 2 (  4620):     4.15   0.227     1.61    58.81
       ================================================
       ID = 3 (  0117):    59.39   3.884     1.92    35.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0117)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0117):    59.39   3.884     1.92    35.78
     + ID2= 2 (  0627):     9.39   0.978     1.58    33.44
       ================================================
       ID = 1 (  0117):    68.78   4.547     1.83    35.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0116)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0117):    68.78   4.547     1.83    35.46
     + ID2= 2 (  2610):   652.50  22.413     2.94    38.57
       ================================================
       ID = 3 (  0116):   721.28  24.103     2.83    38.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   0.679

     PEAK FLOW       (cms)=   0.539 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  33.506
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   2.438 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.503
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00        414.20        0.0350      Main Channel
                    4.30        412.70        0.0350      Main Channel
                    8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .893E+01       0.0          0.17       47.72
      0.16   412.86    .357E+02       0.0          0.28       30.06
      0.24   412.94    .804E+02       0.1          0.36       22.94
      0.32   413.02    .143E+03       0.1          0.44       18.94
      0.39   413.09    .223E+03       0.2          0.51       16.32
      0.47   413.17    .322E+03       0.4          0.58       14.45
      0.55   413.25    .438E+03       0.6          0.64       13.04
      0.63   413.33    .572E+03       0.8          0.70       11.93
      0.71   413.41    .724E+03       1.1          0.76       11.03
      0.79   413.49    .893E+03       1.4          0.81       10.28
      0.87   413.57    .108E+04       1.9          0.86        9.65
      0.95   413.65    .129E+04       2.4          0.92        9.10
      1.03   413.73    .151E+04       2.9          0.97        8.63
      1.11   413.81    .175E+04       3.6          1.01        8.22
      1.18   413.88    .201E+04       4.3          1.06        7.85
      1.26   413.96    .229E+04       5.1          1.11        7.52
      1.34   414.04    .258E+04       6.0          1.15        7.22
      1.42   414.12    .289E+04       6.9          1.20        6.95
      1.50   414.20    .323E+04       8.0          1.24        6.70

                                    <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     2.44     1.83  33.50      0.96      0.92
   OUTFLOW: ID= 1 (  4630)   33.04     2.28     2.00  33.49      0.93      0.91

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0116):   721.28  24.103     2.83    38.27
     + ID2= 2 (  4630):    33.04   2.282     2.00    33.49
       ================================================
       ID = 3 (  2637):   754.32  25.110     2.75    38.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   754.32  25.110     2.75    38.06
```

```
      + ID2= 2 (  0637):     8.36   0.539     1.92    33.51
        ================================================
        ID = 1 (  2637):   762.68  25.386     2.72    38.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.212 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  33.506
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2637):   762.68  25.386     2.72    38.01
      + ID2= 2 (  0636):     3.32   0.212     2.00    33.51
        ================================================
        ID = 3 (  2636):   766.00  25.498     2.69    37.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   1.351 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  33.506
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.315 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  33.505
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2636):   766.00  25.498     2.69    37.99
      + ID2= 2 (  0638):    20.63   1.351     1.92    33.51
        ================================================
        ID = 3 (  2630):   786.63  26.204     2.64    37.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2630):   786.63  26.204     2.64    37.87
      + ID2= 2 (  0639):     4.60   0.315     1.92    33.50
        ================================================
        ID = 1 (  2630):   791.23  26.361     2.64    37.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0709)|   Area    (ha)=  21.19   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.65

     Unit Hyd Qpeak  (cms)=   1.245

     PEAK FLOW       (cms)=   1.106 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  33.508
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

 FINISH
================================================================================
--------------------
  ********************************************
  ** SIMULATION : 100 year Fergus Shand Dam Chi **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=4382.000
| Ptotal= 94.08 mm |                          B=  21.000
--------------------                          C=   0.939
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
```

Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	3.55	1.00	33.31	2.00	18.02	3.00	5.69
0.08	3.91	1.08	54.51	2.08	15.69	3.08	5.34
0.17	4.34	1.17	109.99	2.17	13.83	3.17	5.02
0.25	4.86	1.25	205.33	2.25	12.30	3.25	4.73
0.33	5.50	1.33	132.84	2.33	11.04	3.33	4.47
0.42	6.30	1.42	87.25	2.42	9.97	3.42	4.24
0.50	7.33	1.50	62.23	2.50	9.07	3.50	4.02
0.58	8.67	1.58	46.93	2.58	8.30	3.58	3.82
0.67	10.48	1.67	36.86	2.67	7.63	3.67	3.64
0.75	13.04	1.75	29.86	2.75	7.05	3.75	3.48
0.83	16.82	1.83	24.77	2.83	6.54	3.83	3.32
0.92	22.83	1.92	20.96	2.92	6.09	3.92	3.18

CALIB			
NASHYD (0100)	Area (ha)= 136.98	Curve Number (CN)= 69.0	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.17		

Unit Hyd Qpeak (cms)= 4.464

PEAK FLOW (cms)= 5.477 (i)
TIME TO PEAK (hrs)= 2.833
RUNOFF VOLUME (mm)= 39.053
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.415

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0201)	Area (ha)= 14.60	Curve Number (CN)= 74.0	
ID= 1 DT= 5.0 min	Ia (mm)= 1.50	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.97		

Unit Hyd Qpeak (cms)= 0.575

PEAK FLOW (cms)= 0.820 (i)
TIME TO PEAK (hrs)= 2.583
RUNOFF VOLUME (mm)= 47.141
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.501

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0203)	Area (ha)= 8.20		
ID= 1 DT= 5.0 min	Total Imp(%)= 45.00	Dir. Conn.(%)= 25.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.69	4.51
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	25.00	25.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		205.33	122.38
over (min)		5.00	10.00
Storage Coeff. (min)=		0.79 (ii)	6.51 (ii)
Unit Hyd. Tpeak (min)=		5.00	10.00
Unit Hyd. peak (cms)=		0.34	0.14

		TOTALS
PEAK FLOW	(cms)=	1.912 (iii)
TIME TO PEAK	(hrs)=	1.42
RUNOFF VOLUME	(mm)=	59.84
TOTAL RAINFALL	(mm)=	94.08
RUNOFF COEFFICIENT	=	0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2200)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	14.60	0.820	2.58	47.14
+ ID2= 2 (0203):	8.20	1.912	1.42	59.84
ID = 3 (2200):	22.80	1.993	1.42	51.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(5200)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1980	0.2314
	0.0040	0.0218	0.2920	0.2621
	0.0060	0.0446	0.3980	0.2937
	0.0070	0.0683	0.5150	0.3261
	0.0080	0.0930	0.8290	0.3592
	0.0090	0.1187	1.3520	0.3930
	0.0230	0.1453	2.0570	0.4275
	0.0610	0.1730	2.9590	0.4629
	0.1200	0.2017	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2200)	22.800	1.993	1.42	51.71
OUTFLOW: ID= 1 (5200)	22.800	1.037	2.50	51.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 52.04
TIME SHIFT OF PEAK FLOW (min)= 65.00
MAXIMUM STORAGE USED (ha.m.)= 0.3727

CALIB			
NASHYD (0205)	Area (ha)= 4.80	Curve Number (CN)= 90.0	

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.768 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  70.945
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.754

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.09         0.11
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    205.33       122.38
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.79 (ii)    6.51 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.03          0.047 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=     92.08        49.10         59.82
     TOTAL RAINFALL   (mm)=     94.08        94.08         94.08
     RUNOFF COEFFICIENT   =      0.98         0.52          0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.768     1.83    70.94
     + ID2= 2 (  0206):     0.20   0.047     1.42    59.82
       ================================================
       ID = 3 (  2201):     5.00   0.785     1.83    70.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.785     1.83    70.50
     + ID2= 2 (  5200):    22.80   1.037     2.50    51.65
       ================================================
       ID = 1 (  2201):    27.80   1.567     2.17    55.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.43         2.27
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     35.00        35.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    205.33        85.24
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.97 (ii)    9.06 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.12         0.38          0.432 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.50
     RUNOFF VOLUME    (mm)=     92.08        43.49         47.38
     TOTAL RAINFALL   (mm)=     94.08        94.08         94.08
     RUNOFF COEFFICIENT   =      0.98         0.46          0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.58         0.72
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=      1.20         1.20
     Length            (m)=     25.00        25.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    205.33       122.38
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.79 (ii)    6.51 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.19         0.19          0.303 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.42
```

```
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.84
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0207):     1.30   0.303     1.42    59.84
      + ID2= 2 (  0209):     2.70   0.432     1.50    47.38
        ================================================
        ID = 3 (  2202):     4.00   0.725     1.42    51.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2202):     4.00   0.725     1.42    51.43
      + ID2= 2 (  2201):    27.80   1.567     2.17    55.04
        ================================================
        ID = 1 (  2202):    31.80   1.765     2.08    54.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0100):   136.98   5.477     2.83    39.05
      + ID2= 2 (  2202):    31.80   1.765     2.08    54.59
        ================================================
        ID = 3 (  2100):   168.78   6.786     2.67    41.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.277 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  47.137
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.501

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       122.38
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.83 (ii)    6.88 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.63         0.63          1.012 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.84
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0302):     2.90   0.277     1.92    47.14
      + ID2= 2 (  0304):     4.40   1.012     1.42    59.84
        ================================================
        ID = 3 (  2300):     7.30   1.100     1.42    54.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       122.38
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.83 (ii)    6.88 (ii)
```

```
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.046 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.82
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        85.24
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.79 (ii)    7.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.85          0.965 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      92.08        43.49          47.38
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.46           0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   1.100     1.42    54.80
     + ID2= 2 (  0308):     0.20   0.046     1.42    59.82
       ================================================
       ID = 3 (  2301):     7.50   1.146     1.42    54.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   1.146     1.42    54.93
     + ID2= 2 (  0310):     5.70   0.965     1.42    47.38
       ================================================
       ID = 1 (  2301):    13.20   2.111     1.42    51.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   6.786     2.67    41.98
     + ID2= 2 (  2301):    13.20   2.111     1.42    51.67
       ================================================
       ID = 3 (  2302):   181.98   7.131     2.67    42.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     169.08        80.49
               over (min)        10.00        20.00
     Storage Coeff.  (min)=      11.40 (ii)   19.10 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.10         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.80         8.26          8.850 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.67           1.67
     RUNOFF VOLUME    (mm)=      92.08        42.01          43.51
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.45           0.46

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
```

```
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   7.131     2.67    42.68
     + ID2= 2 (  0400):    82.86   8.850     1.67    43.51
       ================================================
       ID = 3 (  2400):   264.84  13.550     1.75    42.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        411.10        0.0550
                  27.30        410.20        0.0550
                  77.50        409.10        0.0550
                  96.60        409.10        0.0550
                 115.80        408.90        0.0550
                 124.80        409.10        0.0550
                 131.00        408.90    0.0550 /0.0350  Main Channel
                 133.60        408.00        0.0350      Main Channel
                 134.40        407.60        0.0350      Main Channel
                 135.00        407.50        0.0350      Main Channel
                 135.80        407.60        0.0350      Main Channel
                 136.50        408.00        0.0350      Main Channel
                 139.40        408.80    0.0350 /0.0550  Main Channel
                 143.50        408.90        0.0550
                 148.50        408.70        0.0550
                 163.80        408.90        0.0550
                 183.20        408.90        0.0550
                 243.70        409.70        0.0550
                 278.70        410.20        0.0550
                 330.50        411.40        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.19   407.69    .366E+03       0.1          0.51      58.83
      0.37   407.87    .106E+04       0.5          0.81      37.08
      0.56   408.06    .199E+04       1.1          1.00      29.93
      0.74   408.24    .328E+04       2.1          1.14      26.32
      0.93   408.43    .498E+04       3.6          1.28      23.32
      1.11   408.61    .708E+04       5.6          1.43      20.94
      1.30   408.80    .105E+05       8.5          1.45      20.61
      1.49   408.99    .247E+05      14.8          1.07      27.91
      1.68   409.18    .601E+05      30.4          0.91      32.97
      1.87   409.37    .109E+06      58.5          0.96      31.05
      2.06   409.56    .166E+06      98.3          1.06      28.11
      2.25   409.75    .231E+06     150.3          1.17      25.57
      2.44   409.94    .303E+06     215.4          1.28      23.46
      2.64   410.14    .383E+06     293.8          1.38      21.74
      2.83   410.33    .470E+06     390.1          1.49      20.10
      3.02   410.52    .563E+06     502.4          1.60      18.66
      3.21   410.71    .660E+06     628.8          1.71      17.48
      3.40   410.90    .762E+06     769.5          1.81      16.49
      3.59   411.09    .868E+06     924.9          1.91      15.65

                                <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84    13.55    1.75  42.94      1.45      1.13

   OUTFLOW: ID= 1 (  4400)  264.84    11.20    2.42  42.86      1.38      1.26

      **** WARNING : THE HYD WAS CUT TO 2000 POINTS

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.393 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  37.368
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.09

     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   4.338 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  43.658
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.464

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .206E+02       0.0          0.19     101.61
      0.16   412.86    .822E+02       0.0          0.30      64.01
      0.24   412.94    .185E+03       0.1          0.39      48.85
      0.32   413.02    .329E+03       0.1          0.48      40.33
      0.39   413.09    .514E+03       0.2          0.55      34.75
      0.47   413.17    .740E+03       0.4          0.62      30.77
      0.55   413.25    .101E+04       0.6          0.69      27.77
      0.63   413.33    .132E+04       0.9          0.75      25.40
      0.71   413.41    .166E+04       1.2          0.82      23.48
      0.79   413.49    .206E+04       1.6          0.88      21.89
```

```
       0.87   413.57    .249E+04       2.0          0.93      20.54
       0.95   413.65    .296E+04       2.5          0.99      19.39
       1.03   413.73    .347E+04       3.1          1.04      18.38
       1.11   413.81    .403E+04       3.8          1.10      17.49
       1.18   413.88    .462E+04       4.6          1.15      16.71
       1.26   413.96    .526E+04       5.5          1.20      16.00
       1.34   414.04    .594E+04       6.4          1.25      15.37
       1.42   414.12    .666E+04       7.5          1.30      14.79
       1.50   414.20    .742E+04       8.7          1.34      14.27

                                <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0510)   91.44     4.34    2.67  43.66      1.16      1.13
  OUTFLOW: ID= 1 (  4510)   91.44     4.17    3.00  43.65      1.14      1.11



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.231 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  43.645
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.464

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43        26.43
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     593.69        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       132.52
                over (min)       5.00        15.00
     Storage Coeff.  (min)=       5.58 (ii)   13.34 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.20         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       6.85         5.80        10.226 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.50
     RUNOFF VOLUME    (mm)=      93.28        51.77         64.22
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.55          0.68

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        77.66
                over (min)       5.00        15.00
     Storage Coeff.  (min)=       3.46 (ii)   13.08 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.42         0.77          2.681 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      93.28        43.66         65.99
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.46          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87  10.226     1.50    64.22
     + ID2= 2 (  0516):    10.78   2.681     1.33    65.99
       ================================================
       ID = 3 (  2511):    63.65  12.493     1.42    64.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                           0.7700      0.9000   |    3.2130      1.6220
                           1.6000      1.1400   |    3.9540      1.8810
                           2.2900      1.2810   |    4.9000      2.3000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
  INFLOW : ID= 2 (  2511)     63.650     12.493      1.42      64.52
```

```
   OUTFLOW: ID= 1 (  4511)     63.650      4.489      2.08      64.52

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 35.93
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  2.1214

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   4.166     3.00    43.65
     + ID2= 2 (  4511):    63.65   4.489     2.08    64.52
       ================================================
       ID = 3 (  2510):   155.09   7.715     2.58    52.21

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   7.715     2.58    52.21
     + ID2= 2 (  0517):     2.14   0.231     1.75    43.65
       ================================================
       ID = 1 (  2510):   157.23   7.789     2.58    52.10

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      13.56        13.56
    Dep. Storage     (mm)=       0.80         1.50
    Average Slope     (%)=       1.00         2.00
    Length            (m)=     425.28        40.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     205.33       132.52
               over (min)        5.00        15.00
    Storage Coeff.  (min)=       4.57 (ii)   10.87 (ii)
    Unit Hyd. Tpeak (min)=       5.00        15.00
    Unit Hyd. peak  (cms)=       0.23         0.09
                                                      *TOTALS*
    PEAK FLOW       (cms)=       3.76         3.21          5.472 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.58           1.50
    RUNOFF VOLUME    (mm)=      93.28        51.77          64.22
    TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
    RUNOFF COEFFICIENT   =       0.99         0.55           0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       4.19         2.25
    Dep. Storage     (mm)=       0.80         1.50
    Average Slope     (%)=       1.00         1.00
    Length            (m)=     207.20        40.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     205.33       202.03
               over (min)        5.00        10.00
    Storage Coeff.  (min)=       2.97 (ii)    9.52 (ii)
    Unit Hyd. Tpeak (min)=       5.00        10.00
    Unit Hyd. peak  (cms)=       0.28         0.12
                                                      *TOTALS*
    PEAK FLOW       (cms)=       1.16         0.88          1.720 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.50           1.42
    RUNOFF VOLUME    (mm)=      93.28        58.34          70.57
    TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
    RUNOFF COEFFICIENT   =       0.99         0.62           0.75

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
    TOTAL HYD.(ID= 1):   6.44      1.72      1.42   70.57
    ================================================
    MAJOR SYS.(ID= 2):   1.54      0.99      1.42   70.57
    MINOR SYS.(ID= 3):   4.90      0.73      1.25   70.57

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   5.472     1.50    64.22
     + ID2= 2 (  8512):     4.90   0.732     1.25    70.57
       ================================================
       ID = 3 (  2512):    32.03   6.204     1.50    65.19

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
```

```
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.6640      0.9151
                          0.0210      0.1601  |    0.8570      1.0220
                          0.0360      0.3317  |    1.0660      1.1320
                          0.0410      0.4218  |    1.2900      1.2450
                          0.1000      0.5147  |    1.5290      1.3610
                          0.2030      0.6105  |    1.7810      1.4800
                          0.3340      0.7092  |    2.0460      1.6020
                          0.4890      0.8107  |    2.3220      1.7260

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     32.033      6.204      1.50      65.19
   OUTFLOW: ID= 1 (  5512)     32.033      1.506      2.25      65.13

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 24.27
                    TIME SHIFT OF PEAK FLOW        (min)= 45.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  1.3505

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   7.789     2.58    52.10
     + ID2= 2 (  0515):     5.01   0.393     1.83    37.37
       ================================================
       ID = 3 (  2514):   162.24   7.983     2.58    51.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   7.983     2.58    51.64
     + ID2= 2 (  5512):    32.03   1.506     2.25    65.13
       ================================================
       ID = 1 (  2514):   194.27   9.433     2.50    53.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0058)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.861 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  41.075
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2514):   194.27   9.433     2.50    53.87
     + ID2= 2 (  4400):   264.84  11.202     2.42    42.86
       ================================================
       ID = 3 (  2513):   459.11  20.598     2.47    47.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   459.11  20.598     2.47    47.38
     + ID2= 2 (  0058):     6.68   0.861     1.58    41.08
       ================================================
       ID = 1 (  2513):   465.79  20.788     2.44    47.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   4.491 (i)
     TIME TO PEAK    (hrs)=   2.833
     RUNOFF VOLUME    (mm)=  41.154
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   465.79  20.788     2.44    47.29
     + ID2= 2 (  0520):   108.36   4.491     2.83    41.15
       ================================================
       ID = 3 (  2520):   574.15  24.972     2.58    46.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         409.70        0.0550
                 19.70         408.80        0.0550
                 41.70         407.20        0.0550
                 60.50         405.30        0.0550
                 80.00         404.50        0.0550
```

95.70	404.60	0.0550 /0.0350 Main Channel
98.60	403.40	0.0350 Main Channel
100.40	403.40	0.0350 Main Channel
100.80	402.90	0.0350 Main Channel
101.50	402.70	0.0350 Main Channel
102.30	402.80	0.0350 Main Channel
103.30	403.20	0.0350 Main Channel
104.00	403.20	0.0350 Main Channel
105.60	404.40	0.0350 /0.0550 Main Channel
109.70	404.30	0.0550
128.60	404.20	0.0550
154.10	405.40	0.0550
179.10	406.70	0.0550
201.90	408.60	0.0550
224.20	410.60	0.0550

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.34	403.04	.954E+03	0.3	0.70	47.40
0.68	403.38	.304E+04	1.6	1.03	32.27
1.02	403.72	.718E+04	4.5	1.25	26.57
1.36	404.06	.122E+05	9.7	1.58	20.96
1.70	404.40	.251E+05	18.1	1.44	23.04
2.08	404.78	.650E+05	42.3	1.29	25.62
2.46	405.16	.122E+06	86.3	1.40	23.62
2.84	405.54	.192E+06	151.6	1.57	21.10
3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85
4.35	407.05	.554E+06	631.1	2.26	14.63
4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2520)	574.15	24.97	2.58	46.13	1.81	1.39
OUTFLOW: ID= 1 (4500)	574.15	23.26	3.03	46.13	1.78	1.41

CALIB					
NASHYD (0610)	Area	(ha)=	78.05	Curve Number	(CN)= 71.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		1.00		

Unit Hyd Qpeak (cms)= 2.981

PEAK FLOW (cms)= 3.712 (i)
TIME TO PEAK (hrs)= 2.583
RUNOFF VOLUME (mm)= 41.153
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.437

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2610)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (4500):	574.15	23.255	3.03	46.13
	+ ID2= 2 (0610):	78.05	3.712	2.58	41.15
	ID = 3 (2610):	652.20	26.709	2.97	45.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0621)	Area	(ha)=	6.56	Curve Number	(CN)= 70.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.37		

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.593 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 40.084
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.426

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0622)	Area	(ha)=	9.69	Curve Number	(CN)= 70.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.36		

Unit Hyd Qpeak (cms)= 1.028

PEAK FLOW (cms)= 0.888 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 40.083
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.426

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0623)	Area	(ha)=	19.37	Curve Number	(CN)= 70.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.45		

Unit Hyd Qpeak (cms)= 1.644

PEAK FLOW (cms)= 1.554 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 40.088
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.426

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51

     Unit Hyd Qpeak  (cms)=   0.887

     PEAK FLOW       (cms)=   0.877 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  40.089
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39

     Unit Hyd Qpeak  (cms)=   0.658

     PEAK FLOW       (cms)=   0.588 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.085
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4625)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0360      Main Channel
                   4.30        412.70        0.0360      Main Channel
                   8.60        414.20        0.0360      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .108E+02       0.0          0.24      42.13
       0.16   412.86    .434E+02       0.0          0.38      26.54
       0.24   412.94    .976E+02       0.1          0.50      20.26
       0.32   413.02    .174E+03       0.2          0.61      16.72
       0.39   413.09    .271E+03       0.3          0.70      14.41
       0.47   413.17    .390E+03       0.5          0.79      12.76
       0.55   413.25    .532E+03       0.8          0.88      11.51
       0.63   413.33    .694E+03       1.1          0.96      10.53
       0.71   413.41    .879E+03       1.5          1.04       9.74
       0.79   413.49    .108E+04       2.0          1.11       9.08
       0.87   413.57    .131E+04       2.6          1.19       8.52
       0.95   413.65    .156E+04       3.2          1.26       8.04
       1.03   413.73    .183E+04       4.0          1.33       7.62
       1.11   413.81    .213E+04       4.9          1.39       7.25
       1.18   413.88    .244E+04       5.9          1.46       6.93
       1.26   413.96    .278E+04       7.0          1.52       6.64
       1.34   414.04    .313E+04       8.2          1.59       6.37
       1.42   414.12    .351E+04       9.5          1.65       6.13
       1.50   414.20    .392E+04      11.0          1.71       5.92

                                  <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
     INFLOW : ID= 2 (  0625)    6.72     0.59    1.83  40.09      0.50      0.82
     OUTFLOW: ID= 1 (  4625)    6.72     0.53    2.00  40.05      0.48      0.80


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0626)|   Area    (ha)=   1.06
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  50.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.64         0.42
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      84.06        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       108.17
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.73 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.10         0.352 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      93.08        47.94         70.51
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.51          0.75

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4625):     6.72   0.532     2.00    40.05
     + ID2= 2 (  0621):     6.56   0.593     1.83    40.08
       ==========================================================
       ID = 3 (  2625):    13.28   1.089     1.92    40.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
```

```
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    13.28   1.089     1.92    40.07
     + ID2= 2 (  0622):     9.69   0.888     1.83    40.08
       ================================================
       ID = 1 (  2625):    22.97   1.949     1.92    40.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    22.97   1.949     1.92    40.07
     + ID2= 2 (  0623):    19.37   1.554     1.92    40.09
       ================================================
       ID = 3 (  2625):    42.34   3.503     1.92    40.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2625):    42.34   3.503     1.92    40.08
     + ID2= 2 (  0624):    11.84   0.877     2.00    40.09
       ================================================
       ID = 1 (  2625):    54.18   4.365     1.92    40.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    54.18   4.365     1.92    40.08
     + ID2= 2 (  0626):     1.06   0.352     1.33    70.51
       ================================================
       ID = 3 (  2625):    55.24   4.438     1.92    40.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   1.174 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  40.015
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.425

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
```

```
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       402.32
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.59 (ii)    2.20 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.30
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.10          0.412 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      93.56        69.23          86.26
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.99         0.74           0.92

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       150.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    6.89 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.45         0.25          0.588 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      93.56        53.60          69.58
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.99         0.57           0.74

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.588     1.33    69.58
     + ID2= 2 (  6240):     0.79   0.412     1.33    86.26
       ================================================
       ID = 3 ( 26240):     2.75   1.000     1.33    74.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1390      0.0686
                          0.0060      0.0042   |    0.1510      0.0822
                          0.0130      0.0130   |    0.1630      0.0967
                          0.0200      0.0250   |    0.1730      0.1121
                          0.0250      0.0328   |    0.1780      0.1202
                          0.0290      0.0439   |    2.5750      0.1742
                          0.1260      0.0558   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)      2.750     1.000      1.33      74.37
   OUTFLOW: ID= 1 ( 46240)      2.750     0.177      2.00      74.31

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.73
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1192

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       124.69
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    7.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.14          0.204 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      93.56        50.56         59.16
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.54          0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
               YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.2590      0.0708
                          0.0050      0.0089   |    0.2910      0.0871
                          0.0100      0.0187   |    0.3210      0.1045
                          0.0130      0.0298   |    0.3720      0.1438
                          0.0150      0.0422   |    2.8080      0.2087
                          0.2220      0.0559   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)      0.920     0.204      1.42      59.16
   OUTFLOW: ID= 1 ( 46220)      0.920     0.015      3.00      58.67

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.34
                  TIME SHIFT OF PEAK FLOW         (min)= 95.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0420

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05         0.43
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        84.41
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.59 (ii)    5.58 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.16
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.08          0.088 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      93.56        44.35         46.80
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.47          0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
               YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
```

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0004)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (46220):	0.92	0.015	3.00	58.67
+	ID2= 2 (46240):	2.75	0.177	2.00	74.31
	ID = 3 (0004):	3.67	0.191	2.00	70.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0004):	3.67	0.191	2.00	70.39
+	ID2= 2 (6230):	0.48	0.088	1.42	46.80
	ID = 1 (0004):	4.15	0.255	1.50	67.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4620)	
IN= 2---> OUT= 1	Routing time step (min)'= 2.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.456E+01	0.0	0.55	7.70
0.16	412.86	.182E+02	0.1	0.88	4.85
0.24	412.94	.410E+02	0.2	1.15	3.70
0.32	413.02	.729E+02	0.4	1.39	3.05
0.39	413.09	.114E+03	0.7	1.61	2.63
0.47	413.17	.164E+03	1.2	1.82	2.33
0.55	413.25	.223E+03	1.8	2.02	2.10
0.63	413.33	.292E+03	2.5	2.21	1.92
0.71	413.41	.369E+03	3.5	2.39	1.78
0.79	413.49	.456E+03	4.6	2.56	1.66
0.87	413.57	.551E+03	5.9	2.73	1.56
0.95	413.65	.656E+03	7.4	2.89	1.47
1.03	413.73	.770E+03	9.2	3.05	1.39
1.11	413.81	.893E+03	11.2	3.21	1.32
1.18	413.88	.103E+04	13.5	3.36	1.27
1.26	413.96	.117E+04	16.0	3.51	1.21
1.34	414.04	.132E+04	18.9	3.65	1.16
1.42	414.12	.148E+04	22.0	3.79	1.12
1.50	414.20	.165E+04	25.4	3.93	1.08

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0004)	4.15	0.25	1.50	67.66	0.26	1.22
OUTFLOW: ID= 1 (4620)	4.15	0.25	1.58	67.35	0.26	1.21

ADD HYD (0117)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (2625):	55.24	4.438	1.92	40.67
+	ID2= 2 (4620):	4.15	0.249	1.58	67.35
	ID = 3 (0117):	59.39	4.663	1.92	42.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0117)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0117):	59.39	4.663	1.92	42.53
+	ID2= 2 (0627):	9.39	1.174	1.58	40.01
	ID = 1 (0117):	68.78	5.462	1.83	42.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0116)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0117):	68.78	5.462	1.83	42.19
+	ID2= 2 (2610):	652.20	26.709	2.97	45.53
	ID = 3 (0116):	720.98	28.679	2.83	45.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0637)	Area (ha)=	8.36	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.47			

Unit Hyd Qpeak (cms)= 0.679

PEAK FLOW (cms)= 0.650 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 40.088
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.426

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0630)	Area (ha)=	33.04	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	

```
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   2.939 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.085
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70        0.0350      Main Channel
                   8.60         414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .893E+01       0.0          0.17      47.72
        0.16   412.86    .357E+02       0.0          0.28      30.06
        0.24   412.94    .804E+02       0.1          0.36      22.94
        0.32   413.02    .143E+03       0.1          0.44      18.94
        0.39   413.09    .223E+03       0.2          0.51      16.32
        0.47   413.17    .322E+03       0.4          0.58      14.45
        0.55   413.25    .438E+03       0.6          0.64      13.04
        0.63   413.33    .572E+03       0.8          0.70      11.93
        0.71   413.41    .724E+03       1.1          0.76      11.03
        0.79   413.49    .893E+03       1.4          0.81      10.28
        0.87   413.57    .108E+04       1.9          0.86       9.65
        0.95   413.65    .129E+04       2.4          0.92       9.10
        1.03   413.73    .151E+04       2.9          0.97       8.63
        1.11   413.81    .175E+04       3.6          1.01       8.22
        1.18   413.88    .201E+04       4.3          1.06       7.85
        1.26   413.96    .229E+04       5.1          1.11       7.52
        1.34   414.04    .258E+04       6.0          1.15       7.22
        1.42   414.12    .289E+04       6.9          1.20       6.95
        1.50   414.20    .323E+04       8.0          1.24       6.70

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     2.94    1.83  40.08      1.03      0.97
   OUTFLOW: ID= 1 (  4630)   33.04     2.76    2.00  40.08      1.00      0.95



--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0116):   720.98  28.679     2.83    45.21
     + ID2= 2 (  4630):    33.04   2.762     2.00    40.08
       ================================================

       ID = 3 (  2637):   754.02  29.867     2.72    44.99

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   754.02  29.867     2.72    44.99
     + ID2= 2 (  0637):     8.36   0.650     1.92    40.09
       ================================================
       ID = 1 (  2637):   762.38  30.198     2.72    44.94

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.48

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.255 (i)
     TIME TO PEAK    (hrs)=   2.000
     RUNOFF VOLUME    (mm)=  40.088
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   762.38  30.198     2.72    44.94
     + ID2= 2 (  0636):     3.32   0.255     2.00    40.09
       ================================================
       ID = 3 (  2636):   765.70  30.336     2.69    44.91

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.46

     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   1.630 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  40.088
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
```

```
| CALIB           |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.43

     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.379 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  40.087
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   765.70  30.336     2.69    44.91
     + ID2= 2 (  0638):    20.63   1.630     1.92    40.09
       ================================================
       ID = 3 (  2630):   786.33  31.198     2.64    44.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   786.33  31.198     2.64    44.79
     + ID2= 2 (  0639):     4.60   0.379     1.92    40.09
       ================================================
       ID = 1 (  2630):   790.93  31.385     2.64    44.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0709)|   Area    (ha)=  21.19   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.65

     Unit Hyd Qpeak  (cms)=   1.245

     PEAK FLOW       (cms)=   1.335 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=  40.090
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

 FINISH
```

```
--------------------------------------------------------------------------------
--------------------
```

```
  ********************************************
  ** SIMULATION : Hazel                     **
  ********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\TNuman\AppD
|                  |              ata\Local\Temp\
|                  |              41034a8c-d05e-425c-b27b-2fd854ff89f8\910fba68
| Ptotal=212.00 mm |    Comments: Hazel
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    6.00 |  3.00   13.00 |  6.00   23.00 |  9.00   53.00
                1.00    4.00 |  4.00   17.00 |  7.00   13.00 | 10.00   38.00
                2.00    6.00 |  5.00   13.00 |  8.00   13.00 | 11.00   13.00

--------------------------------------------------------------------------------

--------------------
| CALIB           |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    6.00 | 3.083   13.00 | 6.083   23.00 |  9.08   53.00
               0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
               0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
               0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
               0.417    6.00 | 3.417   13.00 | 6.417   23.00 |  9.42   53.00
               0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
               0.583    6.00 | 3.583   13.00 | 6.583   23.00 |  9.58   53.00
               0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
               0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
               0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
               0.917    6.00 | 3.917   13.00 | 6.917   23.00 |  9.92   53.00
               1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
               1.083    4.00 | 4.083   17.00 | 7.083   13.00 | 10.08   38.00
               1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17   38.00
               1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
               1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33   38.00
               1.417    4.00 | 4.417   17.00 | 7.417   13.00 | 10.42   38.00
               1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
               1.583    4.00 | 4.583   17.00 | 7.583   13.00 | 10.58   38.00
               1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67   38.00
               1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
               1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83   38.00
               1.917    4.00 | 4.917   17.00 | 7.917   13.00 | 10.92   38.00
               2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
               2.083    6.00 | 5.083   13.00 | 8.083   13.00 | 11.08   13.00
               2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17   13.00
               2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
               2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33   13.00
               2.417    6.00 | 5.417   13.00 | 8.417   13.00 | 11.42   13.00
               2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
               2.583    6.00 | 5.583   13.00 | 8.583   13.00 | 11.58   13.00
               2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67   13.00
```

2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 4.464

PEAK FLOW (cms)= 13.243 (i)
TIME TO PEAK (hrs)= 11.250
RUNOFF VOLUME (mm)= 170.155
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0201)	Area (ha)=	14.60	Curve Number (CN)=	88.0	
ID= 1 DT= 5.0 min	Ia (mm)=	1.50	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.97			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.575

PEAK FLOW (cms)= 1.537 (i)
TIME TO PEAK (hrs)= 11.083
RUNOFF VOLUME (mm)= 180.757
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.853

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0203)	Area (ha)=	8.20			
ID= 1 DT= 5.0 min	Total Imp(%)=	45.00	Dir. Conn.(%)=	25.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.69	4.51
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	25.00	25.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00

2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	70.29	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.36 (ii)	8.50 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.33	0.12	
			TOTALS
PEAK FLOW (cms)=	0.30	0.88	1.180 (iii)
TIME TO PEAK (hrs)=	9.42	10.00	10.00
RUNOFF VOLUME (mm)=	210.00	181.86	188.90
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.86	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2200)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	14.60	1.537	11.08	180.76
+ ID2= 2 (0203):	8.20	1.180	10.00	188.90
ID = 3 (2200):	22.80	2.384	11.00	183.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0205)	Area (ha)=	4.80	Curve Number (CN)= 96.0
ID= 1 DT= 5.0 min	Ia (mm)=	1.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.41	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.447

PEAK FLOW (cms)= 0.651 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 200.401
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.945

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
STANDHYD (0206)	Area (ha)=	0.20
ID= 1 DT= 5.0 min	Total Imp(%)=	45.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.09	0.11
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	25.00	25.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00

0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	70.29	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.36 (ii)	8.50 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.33	0.12	
			TOTALS
PEAK FLOW (cms)=	0.01	0.02	0.029 (iii)
TIME TO PEAK (hrs)=	9.33	10.00	10.00
RUNOFF VOLUME (mm)=	210.00	181.86	188.87
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.86	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2201)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0205):	4.80	0.651	10.17	200.40
+ ID2= 2 (0206):	0.20	0.029	10.00	188.87
ID = 3 (2201):	5.00	0.677	10.08	199.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2201)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2201):	5.00	0.677	10.08	199.94
+ ID2= 2 (2200):	22.80	2.384	11.00	183.68
ID = 1 (2201):	27.80	2.932	11.00	186.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0209)	Area (ha)= 2.70
ID= 1 DT= 5.0 min	Total Imp(%)= 16.00 Dir. Conn.(%)= 8.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.43	2.27
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.20	1.20
Length	(m)=	35.00	35.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

```
     Max.Eff.Inten.(mm/hr)=      53.00        55.75
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.66 (ii)   11.25 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.32         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.35          0.379 (iii)
     TIME TO PEAK    (hrs)=       9.42        10.00          10.00
     RUNOFF VOLUME    (mm)=     210.00       175.49         178.25
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       0.99         0.83           0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

```
     Max.Eff.Inten.(mm/hr)=      53.00        70.29
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.36 (ii)    8.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.14          0.187 (iii)
     TIME TO PEAK    (hrs)=       9.42        10.00          10.00
     RUNOFF VOLUME    (mm)=     210.00       181.86         188.89
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       0.99         0.86           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.187    10.00   188.89
     + ID2= 2 (  0209):     2.70   0.379    10.00   178.25
       ================================================
       ID = 3 (  2202):     4.00   0.566    10.00   181.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.566    10.00   181.71
     + ID2= 2 (  2201):    27.80   2.932    11.00   186.61
       ================================================
       ID = 1 (  2202):    31.80   3.484    10.00   185.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
```

```
| ADD HYD  (  2100)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98  13.243    11.25   170.15
     + ID2= 2 (  2202):    31.80   3.484    10.00   185.99
       ================================================
       ID = 3 (  2100):   168.78  16.256    11.00   173.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 88.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

```
     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.372 (i)
     TIME TO PEAK    (hrs)=  10.167

     RUNOFF VOLUME    (mm)= 180.743
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.853

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

```
     Max.Eff.Inten.(mm/hr)=     53.00        70.29
```

```
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.43 (ii)    8.98 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.47          0.633 (iii)
     TIME TO PEAK    (hrs)=       9.42        10.00          10.00
     RUNOFF VOLUME    (mm)=     210.00       181.86         188.90
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       0.99         0.86           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0302):     2.90   0.372    10.17   180.74
      + ID2= 2 (  0304):     4.40   0.633    10.00   188.90
        ================================================
        ID = 3 (  2300):     7.30   0.992    10.00   185.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n             =     0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                        ---- TRANSFORMED HYETOGRAPH ----
  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.083    6.00 | 3.083   13.00 | 6.083   23.00 |  9.08   53.00
 0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
 0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
 0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
 0.417    6.00 | 3.417   13.00 | 6.417   23.00 |  9.42   53.00
 0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
 0.583    6.00 | 3.583   13.00 | 6.583   23.00 |  9.58   53.00
 0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
 0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
 0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
 0.917    6.00 | 3.917   13.00 | 6.917   23.00 |  9.92   53.00
 1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
 1.083    4.00 | 4.083   17.00 | 7.083   13.00 | 10.08   38.00
 1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17   38.00
 1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
 1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33   38.00
 1.417    4.00 | 4.417   17.00 | 7.417   13.00 | 10.42   38.00
 1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
 1.583    4.00 | 4.583   17.00 | 7.583   13.00 | 10.58   38.00
 1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67   38.00
 1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
 1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83   38.00
 1.917    4.00 | 4.917   17.00 | 7.917   13.00 | 10.92   38.00
 2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
 2.083    6.00 | 5.083   13.00 | 8.083   13.00 | 11.08   13.00
 2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17   13.00
 2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
 2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33   13.00
 2.417    6.00 | 5.417   13.00 | 8.417   13.00 | 11.42   13.00
 2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
 2.583    6.00 | 5.583   13.00 | 8.583   13.00 | 11.58   13.00
 2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67   13.00
 2.750    6.00 | 5.750   13.00 | 8.750   13.00 | 11.75   13.00
 2.833    6.00 | 5.833   13.00 | 8.833   13.00 | 11.83   13.00
 2.917    6.00 | 5.917   13.00 | 8.917   13.00 | 11.92   13.00
 3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00   13.00

     Max.Eff.Inten.(mm/hr)=      53.00        70.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.43 (ii)    8.98 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.02          0.029 (iii)
     TIME TO PEAK    (hrs)=       9.33        10.00          10.00
     RUNOFF VOLUME    (mm)=     210.00       181.86         188.87
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       0.99         0.86           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 5.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n             =     0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                        ---- TRANSFORMED HYETOGRAPH ----
  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
```

0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=		53.00	55.75	
over (min)		5.00	10.00	
Storage Coeff. (min)=		1.36 (ii)	9.20 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.33	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.07	0.74	0.805 (iii)
TIME TO PEAK	(hrs)=	9.42	10.00	10.00
RUNOFF VOLUME	(mm)=	210.00	175.49	178.25
TOTAL RAINFALL	(mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT	=	0.99	0.83	0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2301)
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2300):	7.30	0.992	10.00	185.66
+ ID2= 2 (0308):	0.20	0.029	10.00	188.87
ID = 3 (2301):	7.50	1.020	10.00	185.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2301)
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2301):	7.50	1.020	10.00	185.74
+ ID2= 2 (0310):	5.70	0.805	10.00	178.25
ID = 1 (2301):	13.20	1.826	10.00	182.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2302)
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2100):	168.78	16.256	11.00	173.14
+ ID2= 2 (2301):	13.20	1.826	10.00	182.51
ID = 3 (2302):	181.98	17.635	11.00	173.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0400)	Area (ha)= 82.86
ID= 1 DT= 5.0 min	Total Imp(%)= 10.00 Dir. Conn.(%)= 3.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	8.29	74.57
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	0.70	2.00
Length	(m)=	1437.00	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00

1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	54.48	
over (min)	20.00	30.00	
Storage Coeff. (min)=	18.14 (ii)	27.14 (ii)	
Unit Hyd. Tpeak (min)=	20.00	30.00	
Unit Hyd. peak (cms)=	0.06	0.04	
			TOTALS
PEAK FLOW (cms)=	0.35	9.86	10.195 (iii)
TIME TO PEAK (hrs)=	10.00	10.25	10.25
RUNOFF VOLUME (mm)=	210.00	172.72	173.84
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	0.99	0.81	0.82

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2400) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2302):	181.98	17.635	11.00	173.82
+ ID2= 2 (0400):	82.86	10.195	10.25	173.84
ID = 3 (2400):	264.84	26.477	11.00	173.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4400) IN= 2---> OUT= 1	Routing time step (min)'= 2.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	411.10	0.0550	
27.30	410.20	0.0550	
77.50	409.10	0.0550	
96.60	409.10	0.0550	
115.80	408.90	0.0550	
124.80	409.10	0.0550	
131.00	408.90	0.0550 /0.0350	Main Channel
133.60	408.00	0.0350	Main Channel
134.40	407.60	0.0350	Main Channel
135.00	407.50	0.0350	Main Channel
135.80	407.60	0.0350	Main Channel
136.50	408.00	0.0350	Main Channel
139.40	408.80	0.0350 /0.0550	Main Channel
143.50	408.90	0.0550	
148.50	408.70	0.0550	
163.80	408.90	0.0550	
183.20	408.90	0.0550	
243.70	409.70	0.0550	
278.70	410.20	0.0550	
330.50	411.40	0.0550	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.19	407.69	.366E+03	0.1	0.51	58.83
0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66
3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2400)		264.84	26.48	11.00	173.82	1.63	0.94
OUTFLOW: ID= 1 (4400)		264.84	24.73	11.31	173.82	1.61	0.96

CALIB NASHYD (0515) ID= 1 DT= 5.0 min				
	Area	(ha)= 5.01	Curve Number	(CN)= 80.0
	Ia	(mm)= 1.50	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)=	0.41		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.467

PEAK FLOW (cms)= 0.616 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 161.698
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.763

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0510)	Area (ha)= 91.44	Curve Number (CN)= 86.0
ID= 1 DT= 5.0 min	Ia (mm)= 1.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.09	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 3.204

PEAK FLOW (cms)= 9.158 (i)
TIME TO PEAK (hrs)= 11.250
RUNOFF VOLUME (mm)= 175.940
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.830

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4510)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.206E+02	0.0	0.19	101.61

0.16	412.86	.822E+02	0.0	0.30	64.01
0.24	412.94	.185E+03	0.1	0.39	48.85
0.32	413.02	.329E+03	0.1	0.48	40.33
0.39	413.09	.514E+03	0.2	0.55	34.75
0.47	413.17	.740E+03	0.4	0.62	30.77
0.55	413.25	.101E+04	0.6	0.69	27.77
0.63	413.33	.132E+04	0.9	0.75	25.40
0.71	413.41	.166E+04	1.2	0.82	23.48
0.79	413.49	.206E+04	1.6	0.88	21.89
0.87	413.57	.249E+04	2.0	0.93	20.54
0.95	413.65	.296E+04	2.5	0.99	19.39
1.03	413.73	.347E+04	3.1	1.04	18.38
1.11	413.81	.403E+04	3.8	1.10	17.49
1.18	413.88	.462E+04	4.6	1.15	16.71
1.26	413.96	.526E+04	5.5	1.20	16.00
1.34	414.04	.594E+04	6.4	1.25	15.37
1.42	414.12	.666E+04	7.5	1.30	14.79
1.50	414.20	.742E+04	8.7	1.34	14.27

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0510)	91.44	9.16	11.25	175.94	1.50	1.34
OUTFLOW:	ID= 1 (4510)	91.44	9.02	11.42	175.93	1.50	1.34

CALIB			
NASHYD (0517)	Area (ha)=	2.14	Curve Number (CN)= 86.0
ID= 1 DT= 5.0 min	Ia (mm)=	1.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.32	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.255

PEAK FLOW (cms)= 0.289 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 175.887
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.830

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0511)	Area (ha)=	52.87	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 30.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	26.43	26.43
Dep. Storage	(mm)=	0.80	1.50
Average Slope	(%)=	1.00	1.00
Length	(m)=	593.69	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00

1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	72.31	
over (min)	10.00	20.00	
Storage Coeff. (min)=	9.59 (ii)	19.48 (ii)	
Unit Hyd. Tpeak (min)=	10.00	20.00	
Unit Hyd. peak (cms)=	0.11	0.06	
			TOTALS
PEAK FLOW (cms)=	2.33	4.99	7.311 (iii)
TIME TO PEAK (hrs)=	10.00	10.08	10.00
RUNOFF VOLUME (mm)=	211.20	185.02	192.87
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.87	0.91

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0516)	Area (ha)= 10.78		
ID= 1 DT= 5.0 min	Total Imp(%)= 45.00	Dir. Conn.(%)= 45.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.85	5.93
Dep. Storage	(mm)=	0.80	1.50
Average Slope	(%)=	1.00	1.00
Length	(m)=	268.08	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.59	
over (min)	5.00	20.00	
Storage Coeff. (min)=	5.95 (ii)	17.36 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.19	0.06	
			TOTALS
PEAK FLOW (cms)=	0.71	0.79	1.506 (iii)
TIME TO PEAK (hrs)=	10.00	10.00	10.00
RUNOFF VOLUME (mm)=	211.20	175.94	191.81
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.83	0.90

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2511)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0511):	52.87	7.311	10.00	192.87
+ ID2= 2 (0516):	10.78	1.506	10.00	191.81
ID = 3 (2511):	63.65	8.818	10.00	192.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2511):    63.65   8.818    10.00   192.69
     + ID2= 2 (  4510):    91.44   9.022    11.42   175.93
       ================================================
       ID = 3 (  2510):   155.09  15.328    11.00   182.81

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09  15.328    11.00   182.81
     + ID2= 2 (  0517):     2.14   0.289    10.08   175.89
       ================================================
       ID = 1 (  2510):   157.23  15.550    11.00   182.72

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      13.56        13.56
    Dep. Storage     (mm)=       0.80         1.50
    Average Slope     (%)=       1.00         2.00
    Length            (m)=     425.28        40.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                        ---- TRANSFORMED HYETOGRAPH ----
 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
0.083    6.00 | 3.083   13.00 | 6.083   23.00 |  9.08   53.00
0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
0.417    6.00 | 3.417   13.00 | 6.417   23.00 |  9.42   53.00
0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
0.583    6.00 | 3.583   13.00 | 6.583   23.00 |  9.58   53.00
0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
0.917    6.00 | 3.917   13.00 | 6.917   23.00 |  9.92   53.00
1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
1.083    4.00 | 4.083   17.00 | 7.083   13.00 | 10.08   38.00
1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17   38.00
1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33   38.00
1.417    4.00 | 4.417   17.00 | 7.417   13.00 | 10.42   38.00
1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
1.583    4.00 | 4.583   17.00 | 7.583   13.00 | 10.58   38.00
1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67   38.00
1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83   38.00
1.917    4.00 | 4.917   17.00 | 7.917   13.00 | 10.92   38.00
2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
2.083    6.00 | 5.083   13.00 | 8.083   13.00 | 11.08   13.00
2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17   13.00
2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33   13.00
2.417    6.00 | 5.417   13.00 | 8.417   13.00 | 11.42   13.00
2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
2.583    6.00 | 5.583   13.00 | 8.583   13.00 | 11.58   13.00
2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67   13.00
2.750    6.00 | 5.750   13.00 | 8.750   13.00 | 11.75   13.00
2.833    6.00 | 5.833   13.00 | 8.833   13.00 | 11.83   13.00
2.917    6.00 | 5.917   13.00 | 8.917   13.00 | 11.92   13.00
3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00   13.00

    Max.Eff.Inten.(mm/hr)=      53.00        72.31
              over (min)        10.00        20.00
    Storage Coeff.  (min)=     7.85 (ii)   15.88 (ii)
    Unit Hyd. Tpeak (min)=      10.00        20.00
    Unit Hyd. peak  (cms)=       0.13         0.07
                                                      *TOTALS*
    PEAK FLOW       (cms)=       1.20         2.62        3.821 (iii)
    TIME TO PEAK    (hrs)=      10.00        10.00         10.00
    RUNOFF VOLUME    (mm)=     211.20       185.02        192.87
    TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
    RUNOFF COEFFICIENT   =       1.00         0.87          0.91


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  86.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       4.19         2.25
    Dep. Storage     (mm)=       0.80         1.50
    Average Slope     (%)=       1.00         1.00
    Length            (m)=     207.20        40.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                        ---- TRANSFORMED HYETOGRAPH ----
 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
0.083    6.00 | 3.083   13.00 | 6.083   23.00 |  9.08   53.00
0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
0.417    6.00 | 3.417   13.00 | 6.417   23.00 |  9.42   53.00
0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
0.583    6.00 | 3.583   13.00 | 6.583   23.00 |  9.58   53.00
0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
```

0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	96.89	
over (min)	5.00	15.00	
Storage Coeff. (min)=	5.10 (ii)	13.90 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.21	0.08	
			TOTALS
PEAK FLOW (cms)=	0.33	0.60	0.927 (iii)
TIME TO PEAK (hrs)=	10.00	10.00	10.00
RUNOFF VOLUME (mm)=	211.20	191.05	198.10
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.90	0.93

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

DUHYD (8512)				
Inlet Cap.= 0.732				
#of Inlets= 1				
Total(cms)= 0.7	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
TOTAL HYD.(ID= 1):	6.44	0.93	10.00	198.10
MAJOR SYS.(ID= 2):	0.23	0.20	10.00	198.10
MINOR SYS.(ID= 3):	6.21	0.73	9.33	198.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2512)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0512):	27.13	3.821	10.00	192.87	
+ ID2= 2 (8512):	6.21	0.732	9.33	198.10	
ID = 3 (2512):	33.34	4.553	10.00	193.85	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2514)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (2510):	157.23	15.550	11.00	182.72	
+ ID2= 2 (2512):	33.34	4.553	10.00	193.85	
ID = 3 (2514):	190.57	19.083	11.00	184.67	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2514)					
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 3 (2514):	190.57	19.083	11.00	184.67	
+ ID2= 2 (0515):	5.01	0.616	10.17	161.70	
ID = 1 (2514):	195.58	19.594	11.00	184.08	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0518)| ID= 1 DT= 5.0 min	Area (ha)=	6.68	Curve Number (CN)=	86.0
	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.20		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00

1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.276

PEAK FLOW (cms)= 0.930 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 172.207
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.812

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2513)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2514):	195.58	19.594	11.00	184.08
	+ ID2= 2 (4400):	264.84	24.727	11.31	173.82
	ID = 3 (2513):	460.42	43.661	11.00	178.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2513)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (2513):	460.42	43.661	11.00	178.18
	+ ID2= 2 (0518):	6.68	0.930	10.00	172.21
	ID = 1 (2513):	467.10	44.342	11.00	178.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0520)	Area (ha)= 108.36	Curve Number (CN)= 86.0		
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 1.20			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 3.449

PEAK FLOW (cms)= 10.462 (i)
TIME TO PEAK (hrs)= 11.333
RUNOFF VOLUME (mm)= 172.535
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2520)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2513):	467.10	44.342	11.00	178.09
	+ ID2= 2 (0520):	108.36	10.462	11.33	172.54
	ID = 3 (2520):	575.46	54.508	11.00	177.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
```

<-------- DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	409.70	0.0550	
19.70	408.80	0.0550	
41.70	407.20	0.0550	
60.50	405.30	0.0550	
80.00	404.50	0.0550	
95.70	404.60	0.0550 /0.0350	Main Channel
98.60	403.40	0.0350	Main Channel
100.40	403.40	0.0350	Main Channel
100.80	402.90	0.0350	Main Channel
101.50	402.70	0.0350	Main Channel
102.30	402.80	0.0350	Main Channel
103.30	403.20	0.0350	Main Channel
104.00	403.20	0.0350	Main Channel
105.60	404.40	0.0350 /0.0550	Main Channel
109.70	404.30	0.0550	
128.60	404.20	0.0550	
154.10	405.40	0.0550	
179.10	406.70	0.0550	
201.90	408.60	0.0550	
224.20	410.60	0.0550	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.34	403.04	.954E+03	0.3	0.70	47.40
0.68	403.38	.304E+04	1.6	1.03	32.27
1.02	403.72	.718E+04	4.5	1.25	26.57
1.36	404.06	.122E+05	9.7	1.58	20.96
1.70	404.40	.251E+05	18.1	1.44	23.04
2.08	404.78	.650E+05	42.3	1.29	25.62
2.46	405.16	.122E+06	86.3	1.40	23.62
2.84	405.54	.192E+06	151.6	1.57	21.10
3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85
4.35	407.05	.554E+06	631.1	2.26	14.63
4.73	407.43	.663E+06	807.8	2.42	13.67
5.11	407.81	.779E+06	1006.4	2.57	12.89
5.49	408.19	.902E+06	1229.0	2.71	12.23
5.86	408.56	.103E+07	1476.4	2.84	11.66
6.24	408.94	.117E+07	1745.6	2.96	11.18
6.62	409.32	.132E+07	2034.5	3.07	10.79
7.00	409.70	.147E+07	2353.2	3.17	10.44

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2520)	575.46	54.51	11.00	177.05	2.18	1.32
OUTFLOW: ID= 1 (4500)	575.46	51.63	11.28	177.05	2.16	1.31

```
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 86.0
```

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00
```

NOTE: RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)=   2.981

PEAK FLOW   (cms)=   8.022 (i)
TIME TO PEAK   (hrs)= 11.167
RUNOFF VOLUME   (mm)= 172.535
TOTAL RAINFALL   (mm)= 212.000
RUNOFF COEFFICIENT   =   0.814

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   575.46  51.631    11.28   177.05
```

```
 + ID2= 2 (  0610):    78.05   8.022    11.17   172.54
   ================================================
   ID = 3 (  2610):   653.51  59.593    11.25   176.51
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0621)|   Area    (ha)=   6.56   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.37
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.677

PEAK FLOW (cms)= 0.857 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.126
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.802

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0622)|   Area    (ha)=   9.69   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.36
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.028

PEAK FLOW (cms)= 1.273 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.123
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.802

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------------------------------------------------------------------
```

```
--------------------
| CALIB            |
| NASHYD   (  0623)|   Area    (ha)=  19.37   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.644

PEAK FLOW (cms)= 2.425 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 170.142
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| CALIB            |
| NASHYD   (  0624)|   Area    (ha)=  11.84   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.51
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.887

PEAK FLOW (cms)= 1.435 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 170.147
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| CALIB            |
| NASHYD   (  0625)|   Area    (ha)=   6.72   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.39
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.868 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.132
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4625)	
IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0360	Main Channel
4.30	412.70	0.0360	Main Channel
8.60	414.20	0.0360	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.108E+02	0.0	0.24	42.13
0.16	412.86	.434E+02	0.0	0.38	26.54
0.24	412.94	.976E+02	0.1	0.50	20.26
0.32	413.02	.174E+03	0.2	0.61	16.72
0.39	413.09	.271E+03	0.3	0.70	14.41
0.47	413.17	.390E+03	0.5	0.79	12.76
0.55	413.25	.532E+03	0.8	0.88	11.51
0.63	413.33	.694E+03	1.1	0.96	10.53
0.71	413.41	.879E+03	1.5	1.04	9.74
0.79	413.49	.108E+04	2.0	1.11	9.08
0.87	413.57	.131E+04	2.6	1.19	8.52
0.95	413.65	.156E+04	3.2	1.26	8.04
1.03	413.73	.183E+04	4.0	1.33	7.62
1.11	413.81	.213E+04	4.9	1.39	7.25
1.18	413.88	.244E+04	5.9	1.46	6.93
1.26	413.96	.278E+04	7.0	1.52	6.64
1.34	414.04	.313E+04	8.2	1.59	6.37
1.42	414.12	.351E+04	9.5	1.65	6.13
1.50	414.20	.392E+04	11.0	1.71	5.92

		<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (	0625)	6.72	0.87	10.08	170.13	0.58	0.90
OUTFLOW: ID= 1 (	4625)	6.72	0.85	10.25	170.10	0.57	0.89

CALIB	
STANDHYD (0626)|	Area (ha)= 1.06
ID= 1 DT= 5.0 min |	Total Imp(%)= 60.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.64	0.42
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	84.06	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00

1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	57.70	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.97 (ii)	11.76 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.28	0.09	
			TOTALS
PEAK FLOW (cms)=	0.08	0.07	0.144 (iii)
TIME TO PEAK (hrs)=	9.75	10.00	10.00
RUNOFF VOLUME (mm)=	211.00	149.17	180.08
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.70	0.85

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 70.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2625)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (4625):	6.72	0.847	10.25	170.10
+ ID2= 2 (0621):	6.56	0.857	10.08	170.13
ID = 3 (2625):	13.28	1.692	10.17	170.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2625)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (2625):	13.28	1.692	10.17	170.11
+ ID2= 2 (0622):	9.69	1.273	10.08	170.12
ID = 1 (2625):	22.97	2.953	10.17	170.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2625)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2625):	22.97	2.953	10.17	170.12
+ ID2= 2 (0623):	19.37	2.425	10.17	170.14
ID = 3 (2625):	42.34	5.378	10.17	170.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2625)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (2625):	42.34	5.378	10.17	170.13
+ ID2= 2 (0624):	11.84	1.435	10.25	170.15
ID = 1 (2625):	54.18	6.802	10.17	170.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2625)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2625):	54.18	6.802	10.17	170.13
+ ID2= 2 (0626):	1.06	0.144	10.00	180.08
ID = 3 (2625):	55.24	6.921	10.17	170.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0627)	Area (ha)=	9.39	Curve Number (CN)= 85.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.20	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00

0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.793

PEAK FLOW (cms)= 1.298 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 169.831
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.801

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (6240)	Area (ha)= 0.79
ID= 1 DT= 5.0 min	Total Imp(%)= 90.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.71	0.08
Dep. Storage	(mm)=	0.52	7.16
Average Slope	(%)=	2.00	2.00
Length	(m)=	20.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

				TOTALS
Max.Eff.Inten.(mm/hr)=		53.00	158.23	
over (min)		5.00	5.00	
Storage Coeff. (min)=		1.02 (ii)	3.77 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.34	0.25	
PEAK FLOW	(cms)=	0.08	0.03	0.116 (iii)
TIME TO PEAK	(hrs)=	9.33	10.00	10.00
RUNOFF VOLUME	(mm)=	211.48	198.67	207.64
TOTAL RAINFALL	(mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT	=	1.00	0.94	0.98

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 88.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (6210)	Area (ha)= 1.96
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.18	0.78
Dep. Storage	(mm)=	0.52	7.16
Average Slope	(%)=	2.00	2.00
Length	(m)=	40.00	40.00

Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	78.11		
over (min)	5.00	10.00		
Storage Coeff. (min)=	1.54 (ii)	9.33 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.33	0.12		
			TOTALS	
PEAK FLOW (cms)=	0.12	0.17	0.285 (iii)	
TIME TO PEAK (hrs)=	9.50	10.00	10.00	
RUNOFF VOLUME (mm)=	211.48	186.45	196.46	
TOTAL RAINFALL (mm)=	212.00	212.00	212.00	
RUNOFF COEFFICIENT =	1.00	0.88	0.93	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 88.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (26240)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (6210):	1.96	0.285	10.00	196.46
	+ ID2= 2 (6240):	0.79	0.116	10.00	207.64
	ID = 3 (26240):	2.75	0.401	10.00	199.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB / STANDHYD (6220)	Area (ha)= 0.92	
ID= 1 DT= 5.0 min	Total Imp(%)= 40.00	Dir. Conn.(%)= 20.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.37	0.55
Dep. Storage	(mm)=	0.52	7.16
Average Slope	(%)=	2.00	2.00
Length	(m)=	40.00	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00

2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	69.15	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.54 (ii)	9.72 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.33	0.11	
			TOTALS
PEAK FLOW (cms)=	0.03	0.11	0.133 (iii)
TIME TO PEAK (hrs)=	9.42	10.00	10.00
RUNOFF VOLUME (mm)=	211.48	183.55	189.13
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.87	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 88.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (6230)	Area (ha)=	0.48	
ID= 1 DT= 5.0 min	Total Imp(%)=	10.00	Dir. Conn.(%)= 5.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.05	0.43
Dep. Storage	(mm)=	0.52	7.16
Average Slope	(%)=	2.00	2.00
Length	(m)=	20.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	54.14	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.02 (ii)	6.97 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.14	
			TOTALS
PEAK FLOW (cms)=	0.00	0.06	0.068 (iii)
TIME TO PEAK (hrs)=	9.25	10.00	10.00
RUNOFF VOLUME (mm)=	211.48	176.93	178.64
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.83	0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 88.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (26240):	2.75	0.401	10.00	199.67	
+ ID2= 2 (6220):	0.92	0.133	10.00	189.13	
ID = 3 (0004):	3.67	0.534	10.00	197.03	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0004):	3.67	0.534	10.00	197.03	

```
      + ID2= 2 (  6230):     0.48   0.068    10.00   178.64
        ================================================
        ID = 1 (  0004):     4.15   0.602    10.00   194.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70        0.0350      Main Channel
                   8.60         414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .456E+01       0.0         0.55        7.70
        0.16   412.86    .182E+02       0.1         0.88        4.85
        0.24   412.94    .410E+02       0.2         1.15        3.70
        0.32   413.02    .729E+02       0.4         1.39        3.05
        0.39   413.09    .114E+03       0.7         1.61        2.63
        0.47   413.17    .164E+03       1.2         1.82        2.33
        0.55   413.25    .223E+03       1.8         2.02        2.10
        0.63   413.33    .292E+03       2.5         2.21        1.92
        0.71   413.41    .369E+03       3.5         2.39        1.78
        0.79   413.49    .456E+03       4.6         2.56        1.66
        0.87   413.57    .551E+03       5.9         2.73        1.56
        0.95   413.65    .656E+03       7.4         2.89        1.47
        1.03   413.73    .770E+03       9.2         3.05        1.39
        1.11   413.81    .893E+03      11.2         3.21        1.32
        1.18   413.88    .103E+04      13.5         3.36        1.27
        1.26   413.96    .117E+04      16.0         3.51        1.21
        1.34   414.04    .132E+04      18.9         3.65        1.16
        1.42   414.12    .148E+04      22.0         3.79        1.12
        1.50   414.20    .165E+04      25.4         3.93        1.08

                                <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0004)    4.15     0.60   10.00 194.90      0.37      1.52
   OUTFLOW: ID= 1 (  4620)    4.15     0.60   10.00 194.89      0.36      1.52



--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0117)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2625):    55.24   6.921    10.17   170.32
     + ID2= 2 (  4620):     4.15   0.602    10.00   194.89
       ================================================
       ID = 3 (  0117):    59.39   7.419    10.08   172.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0117)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0117):    59.39   7.419    10.08   172.04
     + ID2= 2 (  0627):     9.39   1.298    10.00   169.83
       ================================================
       ID = 1 (  0117):    68.78   8.675    10.08   171.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0116)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0117):    68.78   8.675    10.08   171.74
     + ID2= 2 (  2610):   653.51  59.593    11.25   176.51
       ================================================
       ID = 3 (  0116):   722.29  65.896    11.14   176.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                                ---- TRANSFORMED HYETOGRAPH ----
          TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
           hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
         0.083    6.00 | 3.083   13.00 | 6.083   23.00 |  9.08   53.00
         0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
         0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
         0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
         0.417    6.00 | 3.417   13.00 | 6.417   23.00 |  9.42   53.00
         0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
         0.583    6.00 | 3.583   13.00 | 6.583   23.00 |  9.58   53.00
         0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
         0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
         0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
         0.917    6.00 | 3.917   13.00 | 6.917   23.00 |  9.92   53.00
         1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
         1.083    4.00 | 4.083   17.00 | 7.083   13.00 | 10.08   38.00
         1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17   38.00
         1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
         1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33   38.00
         1.417    4.00 | 4.417   17.00 | 7.417   13.00 | 10.42   38.00
         1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
         1.583    4.00 | 4.583   17.00 | 7.583   13.00 | 10.58   38.00
         1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67   38.00
         1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
         1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83   38.00
         1.917    4.00 | 4.917   17.00 | 7.917   13.00 | 10.92   38.00
         2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
         2.083    6.00 | 5.083   13.00 | 8.083   13.00 | 11.08   13.00
         2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17   13.00
         2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
         2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33   13.00
         2.417    6.00 | 5.417   13.00 | 8.417   13.00 | 11.42   13.00
         2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
```

2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.679

PEAK FLOW (cms)= 1.035 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 170.144
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB							
NASHYD (0630)	Area (ha)= 33.04		Curve Number (CN)= 85.0				
ID= 1 DT= 5.0 min	Ia (mm)= 5.00		# of Linear Res.(N)= 3.00				
	U.H. Tp(hrs)= 0.38						

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 3.321

PEAK FLOW (cms)= 4.294 (i)
TIME TO PEAK (hrs)= 10.083
RUNOFF VOLUME (mm)= 170.129
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.802

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(4630)			
IN= 2---> OUT= 1	Routing time step (min)'= 5.00		

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.893E+01	0.0	0.17	47.72
0.16	412.86	.357E+02	0.0	0.28	30.06
0.24	412.94	.804E+02	0.1	0.36	22.94
0.32	413.02	.143E+03	0.1	0.44	18.94
0.39	413.09	.223E+03	0.2	0.51	16.32
0.47	413.17	.322E+03	0.4	0.58	14.45
0.55	413.25	.438E+03	0.6	0.64	13.04
0.63	413.33	.572E+03	0.8	0.70	11.93
0.71	413.41	.724E+03	1.1	0.76	11.03
0.79	413.49	.893E+03	1.4	0.81	10.28
0.87	413.57	.108E+04	1.9	0.86	9.65
0.95	413.65	.129E+04	2.4	0.92	9.10
1.03	413.73	.151E+04	2.9	0.97	8.63
1.11	413.81	.175E+04	3.6	1.01	8.22
1.18	413.88	.201E+04	4.3	1.06	7.85
1.26	413.96	.229E+04	5.1	1.11	7.52
1.34	414.04	.258E+04	6.0	1.15	7.22
1.42	414.12	.289E+04	6.9	1.20	6.95
1.50	414.20	.323E+04	8.0	1.24	6.70

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0630)	33.04	4.29	10.08	170.13	1.19	1.06
OUTFLOW: ID= 1 (4630)	33.04	4.23	10.17	170.12	1.18	1.06

ADD HYD (2637)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0116):	722.29	65.896	11.14	176.05

```
      + ID2= 2 (  4630):    33.04   4.228    10.17   170.12
        ================================================
        ID = 3 (  2637):   755.33  69.296    11.11   175.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2637):   755.33  69.296    11.11   175.79
      + ID2= 2 (  0637):     8.36   1.035    10.25   170.14
        ================================================
        ID = 1 (  2637):   763.69  70.170    11.08   175.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                          ---- TRANSFORMED HYETOGRAPH ----
 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
0.083    6.00 | 3.083   13.00 | 6.083   23.00 |  9.08   53.00
0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
0.417    6.00 | 3.417   13.00 | 6.417   23.00 |  9.42   53.00
0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
0.583    6.00 | 3.583   13.00 | 6.583   23.00 |  9.58   53.00
0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
0.917    6.00 | 3.917   13.00 | 6.917   23.00 |  9.92   53.00
1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
1.083    4.00 | 4.083   17.00 | 7.083   13.00 | 10.08   38.00
1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17   38.00
1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33   38.00
1.417    4.00 | 4.417   17.00 | 7.417   13.00 | 10.42   38.00
1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
1.583    4.00 | 4.583   17.00 | 7.583   13.00 | 10.58   38.00
1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67   38.00
1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83   38.00
1.917    4.00 | 4.917   17.00 | 7.917   13.00 | 10.92   38.00
2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
2.083    6.00 | 5.083   13.00 | 8.083   13.00 | 11.08   13.00
2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17   13.00
2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33   13.00
2.417    6.00 | 5.417   13.00 | 8.417   13.00 | 11.42   13.00
2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
2.583    6.00 | 5.583   13.00 | 8.583   13.00 | 11.58   13.00
2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67   13.00
2.750    6.00 | 5.750   13.00 | 8.750   13.00 | 11.75   13.00
2.833    6.00 | 5.833   13.00 | 8.833   13.00 | 11.83   13.00
2.917    6.00 | 5.917   13.00 | 8.917   13.00 | 11.92   13.00
3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00   13.00

     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.409 (i)
     TIME TO PEAK    (hrs)=  10.250
     RUNOFF VOLUME    (mm)= 170.145
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.803

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2637):   763.69  70.170    11.08   175.73
      + ID2= 2 (  0636):     3.32   0.409    10.25   170.14
        ================================================
        ID = 3 (  2636):   767.01  70.519    11.08   175.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                          ---- TRANSFORMED HYETOGRAPH ----
 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
0.083    6.00 | 3.083   13.00 | 6.083   23.00 |  9.08   53.00
0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17   53.00
0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33   53.00
0.417    6.00 | 3.417   13.00 | 6.417   23.00 |  9.42   53.00
0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
0.583    6.00 | 3.583   13.00 | 6.583   23.00 |  9.58   53.00
0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67   53.00
0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83   53.00
0.917    6.00 | 3.917   13.00 | 6.917   23.00 |  9.92   53.00
1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
1.083    4.00 | 4.083   17.00 | 7.083   13.00 | 10.08   38.00
1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17   38.00
1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33   38.00
1.417    4.00 | 4.417   17.00 | 7.417   13.00 | 10.42   38.00
1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
1.583    4.00 | 4.583   17.00 | 7.583   13.00 | 10.58   38.00
1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67   38.00
1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83   38.00
1.917    4.00 | 4.917   17.00 | 7.917   13.00 | 10.92   38.00
2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
```

2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.713

PEAK FLOW (cms)= 2.567 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 170.143
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0639)	Area	(ha)=	4.60	Curve Number (CN)=	85.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.43		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.409

PEAK FLOW (cms)= 0.582 (i)
TIME TO PEAK (hrs)= 10.167
RUNOFF VOLUME (mm)= 170.139
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2630)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2636):	767.01	70.519	11.08	175.71
+ ID2= 2 (0638):	20.63	2.567	10.17	170.14
ID = 3 (2630):	787.64	72.676	11.08	175.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2630)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2630):	787.64	72.676	11.08	175.56
+ ID2= 2 (0639):	4.60	0.582	10.17	170.14
ID = 1 (2630):	792.24	73.152	11.08	175.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0709)	Area	(ha)=	21.19	Curve Number (CN)=	85.0
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.65		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00

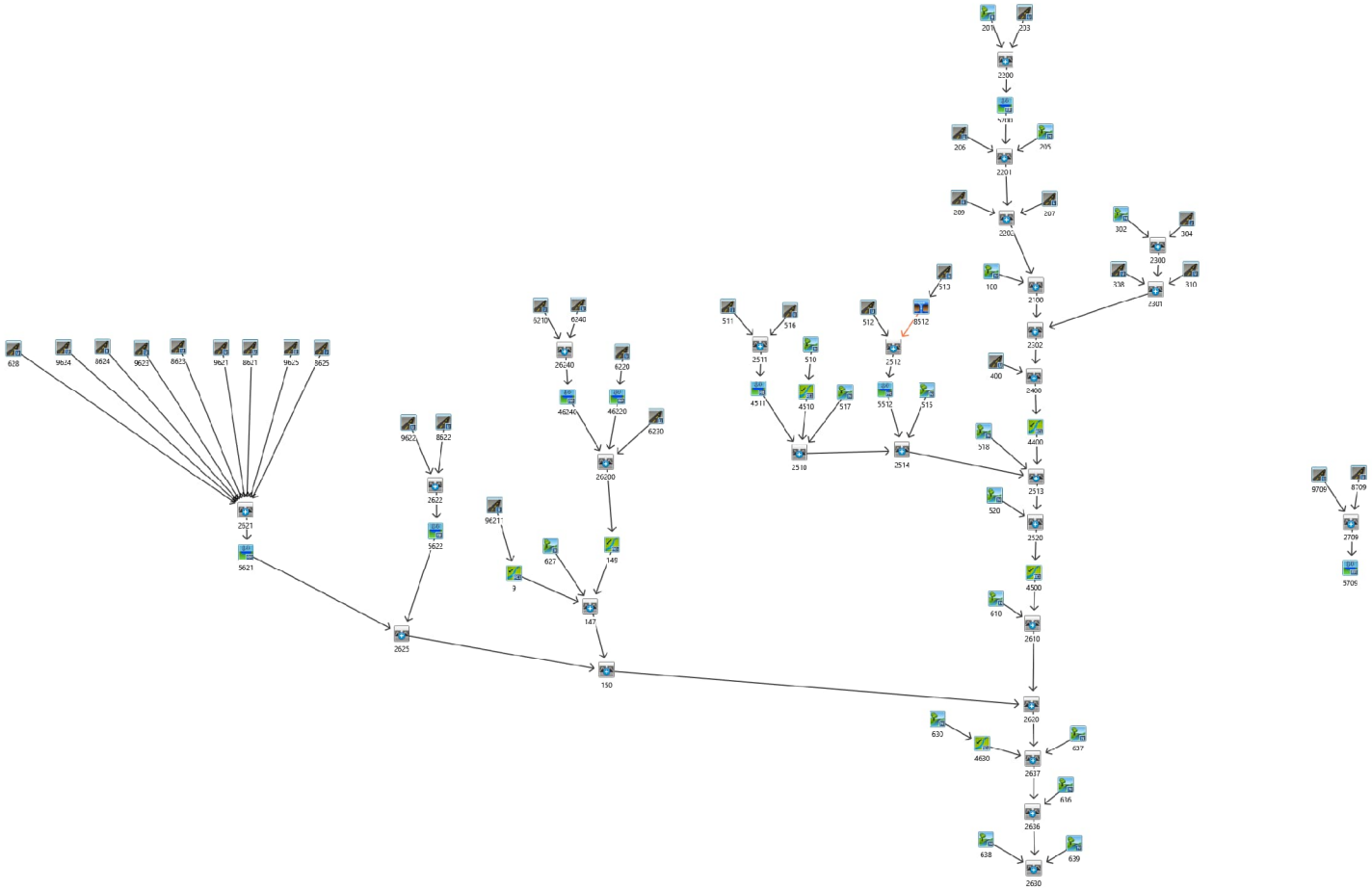
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.245

PEAK FLOW (cms)= 2.406 (i)
TIME TO PEAK (hrs)= 10.500
RUNOFF VOLUME (mm)= 170.152
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH


201
203
2300
206
205
2201
209
207
2202
302
304
2300
100
2100
308
310
2301
513
8512
5210
6240
511
516
512
26240
6220
2511
510
2512
46240
46220
6230
4511
4510
517
5512
515
26200
2510
2514
518
4400
2513
9622
8622
520
2520
2622
5622
9621
627
149
4500
610
2610
2625
147
150
2620
630
637
4630
2637
616
2636
638
639
2630
628
9624
8624
9623
8623
9621
8621
9625
8625
2521
5621
9709
8709
2709
5709

```
----------
  **********************************************
  ** SIMULATION : 2 year Fergus Shand Dam Chica **
  **********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 721.000
| Ptotal= 36.04 mm |                          B=   6.000
--------------------                          C=   0.796
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.15	1.00	10.02	2.00	6.24	3.00	2.89
0.08	2.28	1.08	15.64	2.08	5.65	3.08	2.77
0.17	2.44	1.17	36.22	2.17	5.18	3.17	2.67
0.25	2.62	1.25	106.90	2.25	4.78	3.25	2.57
0.33	2.83	1.33	46.53	2.33	4.44	3.33	2.48
0.42	3.08	1.42	25.96	2.42	4.15	3.42	2.40
0.50	3.39	1.50	17.80	2.50	3.90	3.50	2.32
0.58	3.79	1.58	13.52	2.58	3.68	3.58	2.25
0.67	4.29	1.67	10.91	2.67	3.49	3.67	2.18
0.75	4.97	1.75	9.16	2.75	3.31	3.75	2.12
0.83	5.94	1.83	7.91	2.83	3.16	3.83	2.06
0.92	7.43	1.92	6.97	2.92	3.02	3.92	2.01

```
--------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.17

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   0.841 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=   6.637
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.184

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.97

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.153 (i)
     TIME TO PEAK    (hrs)=   2.633
     RUNOFF VOLUME    (mm)=   9.637
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.267

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.


     Max.Eff.Inten.(mm/hr)=      95.12        22.79
               over (min)         5.00        14.00
     Storage Coeff.  (min)=       1.07 (ii)   12.29 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=       0.50         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.58         0.17          0.618 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.60          1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66         15.76
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.94         0.27          0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.153     2.63     9.64
     + ID2= 2 (  0203):     8.20   0.618     1.33    15.76
       ================================================
       ID = 3 (  2200):    22.80   0.622     1.33    11.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1980      0.2314
                          0.0040      0.0218   |    0.2920      0.2621
                          0.0060      0.0446   |    0.3980      0.2937
                          0.0070      0.0683   |    0.5150      0.3261
                          0.0080      0.0930   |    0.8290      0.3592
                          0.0090      0.1187   |    1.3520      0.3930
                          0.0230      0.1453   |    2.0570      0.4275
                          0.0610      0.1730   |    2.9590      0.4629
                          0.1200      0.2017   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      0.622      1.33      11.84
   OUTFLOW: ID= 1 (  5200)     22.800      0.102      4.10      11.44

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.38
                 TIME SHIFT OF PEAK FLOW         (min)=166.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.1929
```

```
     **** WARNING : SELECTED ROUTING TIME STEP DENIED.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.191 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.008
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.527

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      95.12        22.79
               over (min)        5.00        14.00
     Storage Coeff.  (min)=       1.07 (ii)   12.29 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=       0.50         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.015 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.60           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.72
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.191     1.83    19.01
     + ID2= 2 (  0206):     0.20   0.015     1.33    15.72
       ================================================
       ID = 3 (  2201):     5.00   0.195     1.83    18.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.195     1.83    18.88
     + ID2= 2 (  5200):    22.80   0.102     4.10    11.44
       ================================================
       ID = 1 (  2201):    27.80   0.203     1.83    12.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
     Max.Eff.Inten.(mm/hr)=      95.12        12.09
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       1.31 (ii)   18.99 (ii)
     Unit Hyd. Tpeak (min)=       4.00        20.00
     Unit Hyd. peak  (cms)=       0.48         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.04          0.065 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.73           1.33
     RUNOFF VOLUME    (mm)=      34.04         7.85           9.94
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.22           0.28

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      95.12        22.79
               over (min)        5.00        14.00
     Storage Coeff.  (min)=       1.07 (ii)   12.29 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=       0.50         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.03          0.098 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.60           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.75
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44
```

```
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.098     1.33    15.75
     + ID2= 2 (  0209):     2.70   0.065     1.33     9.94
       ================================================
       ID = 3 (  2202):     4.00   0.163     1.33    11.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.163     1.33    11.83
     + ID2= 2 (  2201):    27.80   0.203     1.83    12.78
       ================================================
       ID = 1 (  2202):    31.80   0.280     1.77    12.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   0.841     3.00     6.64
     + ID2= 2 (  2202):    31.80   0.280     1.77    12.66
       ================================================
       ID = 3 (  2100):   168.78   0.970     2.97     7.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.051 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=   9.637
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.267

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
     Max.Eff.Inten.(mm/hr)=      95.12        22.79
               over (min)        5.00        14.00
     Storage Coeff.  (min)=       1.13 (ii)   12.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=       0.50         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.31         0.09          0.329 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.60           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.76
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.051     1.93     9.64
     + ID2= 2 (  0304):     4.40   0.329     1.33    15.76
       ================================================
       ID = 3 (  2300):     7.30   0.334     1.33    13.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      95.12        22.79
               over (min)        5.00        14.00
     Storage Coeff.  (min)=       1.13 (ii)   12.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=       0.50         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.015 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.60           1.33
     RUNOFF VOLUME    (mm)=      34.04         9.66          15.72
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.27           0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
```

```
          THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
     Max.Eff.Inten.(mm/hr)=      95.12        13.59
               over (min)        5.00        16.00
     Storage Coeff.  (min)=       1.07 (ii)   14.86 (ii)
     Unit Hyd. Tpeak (min)=       4.00        16.00
     Unit Hyd. peak  (cms)=       0.50         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.10          0.145 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.63           1.33
     RUNOFF VOLUME    (mm)=      34.04         7.85           9.94
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.22           0.28

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2300):     7.30   0.334     1.33    13.32
      + ID2= 2 (  0308):     0.20   0.015     1.33    15.72
        ================================================
        ID = 3 (  2301):     7.50   0.349     1.33    13.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2301):     7.50   0.349     1.33    13.39
      + ID2= 2 (  0310):     5.70   0.145     1.33     9.94
        ================================================
        ID = 1 (  2301):    13.20   0.494     1.33    11.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2100):   168.78   0.970     2.97     7.77
      + ID2= 2 (  2301):    13.20   0.494     1.33    11.90
        ================================================
        ID = 3 (  2302):   181.98   1.047     2.87     8.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 2.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      57.01        11.22
               over (min)       18.00        36.00
     Storage Coeff.  (min)=      17.62 (ii)   34.54 (ii)
     Unit Hyd. Tpeak (min)=      18.00        36.00
     Unit Hyd. peak  (cms)=       0.06         0.03
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.25         0.91          1.047 (iii)
     TIME TO PEAK    (hrs)=       1.60         2.03           1.97
     RUNOFF VOLUME    (mm)=      34.04         7.45           8.24
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.94         0.21           0.23

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2302):   181.98   1.047     2.87     8.07
      + ID2= 2 (  0400):    82.86   1.047     1.97     8.24
        ================================================
        ID = 3 (  2400):   264.84   1.947     2.03     8.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         411.10        0.0550
                 27.30         410.20        0.0550
                 77.50         409.10        0.0550
                 96.60         409.10        0.0550
                115.80         408.90        0.0550
                124.80         409.10        0.0550
                131.00         408.90    0.0550 /0.0350  Main Channel
                133.60         408.00        0.0350      Main Channel
                134.40         407.60        0.0350      Main Channel
                135.00         407.50        0.0350      Main Channel
                135.80         407.60        0.0350      Main Channel
                136.50         408.00        0.0350      Main Channel
```

```
              139.40        408.80    0.0350 /0.0550  Main Channel
              143.50        408.90        0.0550
              148.50        408.70        0.0550
              163.80        408.90        0.0550
              183.20        408.90        0.0550
              243.70        409.70        0.0550
              278.70        410.20        0.0550
              330.50        411.40        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.19   407.69    .366E+03       0.1          0.51      58.83
      0.37   407.87    .106E+04       0.5          0.81      37.08
      0.56   408.06    .199E+04       1.1          1.00      29.93
      0.74   408.24    .328E+04       2.1          1.14      26.32
      0.93   408.43    .498E+04       3.6          1.28      23.32
      1.11   408.61    .708E+04       5.6          1.43      20.94
      1.30   408.80    .105E+05       8.5          1.45      20.61
      1.49   408.99    .247E+05      14.8          1.07      27.91
      1.68   409.18    .601E+05      30.4          0.91      32.97
      1.87   409.37    .109E+06      58.5          0.96      31.05
      2.06   409.56    .166E+06      98.3          1.06      28.11
      2.25   409.75    .231E+06     150.3          1.17      25.57
      2.44   409.94    .303E+06     215.4          1.28      23.46
      2.64   410.14    .383E+06     293.8          1.38      21.74
      2.83   410.33    .470E+06     390.1          1.49      20.10
      3.02   410.52    .563E+06     502.4          1.60      18.66
      3.21   410.71    .660E+06     628.8          1.71      17.48
      3.40   410.90    .762E+06     769.5          1.81      16.49
      3.59   411.09    .868E+06     924.9          1.91      15.65

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84     1.95    2.03   8.13      0.72      1.12
   OUTFLOW: ID= 1 (  4400)  264.84     1.70    2.67   8.12      0.67      1.08



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.067 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.963
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.193

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.09

     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   0.784 (i)
     TIME TO PEAK    (hrs)=   2.750
     RUNOFF VOLUME    (mm)=   8.627
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.239

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00        414.20        0.0350      Main Channel
                    4.30        412.70        0.0350      Main Channel
                    8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .206E+02       0.0          0.19     101.61
      0.16   412.86    .822E+02       0.0          0.30      64.01
      0.24   412.94    .185E+03       0.1          0.39      48.85
      0.32   413.02    .329E+03       0.1          0.48      40.33
      0.39   413.09    .514E+03       0.2          0.55      34.75
      0.47   413.17    .740E+03       0.4          0.62      30.77
      0.55   413.25    .101E+04       0.6          0.69      27.77
      0.63   413.33    .132E+04       0.9          0.75      25.40
      0.71   413.41    .166E+04       1.2          0.82      23.48
      0.79   413.49    .206E+04       1.6          0.88      21.89
      0.87   413.57    .249E+04       2.0          0.93      20.54
      0.95   413.65    .296E+04       2.5          0.99      19.39
      1.03   413.73    .347E+04       3.1          1.04      18.38
      1.11   413.81    .403E+04       3.8          1.10      17.49
      1.18   413.88    .462E+04       4.6          1.15      16.71
      1.26   413.96    .526E+04       5.5          1.20      16.00
      1.34   414.04    .594E+04       6.4          1.25      15.37
      1.42   414.12    .666E+04       7.5          1.30      14.79
      1.50   414.20    .742E+04       8.7          1.34      14.27

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0510)   91.44     0.78    2.75   8.63      0.61      0.73
   OUTFLOW: ID= 1 (  4510)   91.44     0.72    3.17   8.62      0.59      0.72



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.042 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=   8.624
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.239

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     26.43        26.43
     Dep. Storage     (mm)=      0.80         1.50
```

```
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     593.69        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      76.72        25.83
               over (min)        10.00        25.00
     Storage Coeff.  (min)=       8.27 (ii)   23.20 (ii)
     Unit Hyd. Tpeak (min)=      10.00        25.00
     Unit Hyd. peak  (cms)=       0.13         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.57         0.87          2.863 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.75           1.42
     RUNOFF VOLUME    (mm)=      35.24        11.21          18.42
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.98         0.31           0.51


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        10.45
               over (min)        5.00        30.00
     Storage Coeff.  (min)=       4.49 (ii)   25.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00        30.00
     Unit Hyd. peak  (cms)=       0.23         0.04
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.09         0.10          1.106 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.83           1.33
     RUNOFF VOLUME    (mm)=      35.24         8.63          20.60
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.98         0.24           0.57

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   2.863     1.42    18.42
     + ID2= 2 (  0516):    10.78   1.106     1.33    20.60
       ====================================================
       ID = 3 (  2511):    63.65   3.669     1.42    18.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF

| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                           0.7700      0.9000   |    3.2130      1.6220
                           1.6000      1.1400   |    3.9540      1.8810
                           2.2900      1.2810   |    4.9000      2.3000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650      3.669      1.42      18.79
   OUTFLOW: ID= 1 (  4511)     63.650      0.614      2.67      18.78

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.74
                  TIME SHIFT OF PEAK FLOW         (min)= 75.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7179

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   0.725     3.17     8.62
     + ID2= 2 (  4511):    63.65   0.614     2.67    18.78
       ====================================================
       ID = 3 (  2510):   155.09   1.326     3.08    12.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   1.326     3.08    12.79
     + ID2= 2 (  0517):     2.14   0.042     1.75     8.62
       ====================================================
       ID = 1 (  2510):   157.23   1.335     3.08    12.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        25.83
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       5.93 (ii)   18.06 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.19         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.63         0.52          1.747 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      35.24        11.21          18.42
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.98         0.31           0.51


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
```

```
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     207.20        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        42.42
                 over (min)        5.00        20.00
     Storage Coeff.  (min)=       3.85 (ii)   16.10 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.25         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.54         0.15         0.574 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67          1.33
     RUNOFF VOLUME    (mm)=      35.24        13.63         21.19
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.98         0.38          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=    1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      0.57      1.33   21.19
     ==================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   6.44      0.57      1.33   21.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   1.747     1.33    18.42
     + ID2= 2 (  8512):     6.44   0.574     1.33    21.19
       ================================================
       ID = 3 (  2512):    33.57   2.321     1.33    18.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.6640      0.9151
                          0.0210      0.1601   |    0.8570      1.0220
                          0.0360      0.3317   |    1.0660      1.1320
                          0.0410      0.4218   |    1.2900      1.2450
                          0.1000      0.5147   |    1.5290      1.3610
                          0.2030      0.6105   |    1.7810      1.4800
                          0.3340      0.7092   |    2.0460      1.6020
                          0.4890      0.8107   |    2.3220      1.7260

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     33.570      2.321      1.33      18.95
   OUTFLOW: ID= 1 (  5512)     33.570      0.129      4.00      18.89

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.54
                  TIME SHIFT OF PEAK FLOW         (min)=160.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5414

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   1.335     3.08    12.73
     + ID2= 2 (  0515):     5.01   0.067     1.83     6.96
       ================================================
       ID = 3 (  2514):   162.24   1.356     3.08    12.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   1.356     3.08    12.56
     + ID2= 2 (  5512):    33.57   0.129     4.00    18.89
       ================================================
       ID = 1 (  2514):   195.81   1.466     3.08    13.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0518)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.134 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   7.134
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.198

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2514):   195.81   1.466     3.08    13.64
     + ID2= 2 (  4400):   264.84   1.703     2.67     8.12
       ================================================
       ID = 3 (  2513):   460.65   3.129     2.90    10.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
```

```
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   460.65   3.129     2.90    10.40
     + ID2= 2 (  0518):     6.68   0.134     1.58     7.13
       ================================================
       ID = 1 (  2513):   467.33   3.154     2.87    10.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
------------------   U.H. Tp(hrs)=   1.20

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   0.706 (i)
     TIME TO PEAK    (hrs)=   3.033
     RUNOFF VOLUME    (mm)=   7.148
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.198

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   467.33   3.154     2.87    10.36
     + ID2= 2 (  0520):   108.36   0.706     3.03     7.15
       ================================================
       ID = 3 (  2520):   575.69   3.857     2.93     9.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 0.00         409.70        0.0550
                19.70         408.80        0.0550
                41.70         407.20        0.0550
                60.50         405.30        0.0550
                80.00         404.50        0.0550
                95.70         404.60    0.0550 /0.0350  Main Channel
                98.60         403.40        0.0350      Main Channel
               100.40         403.40        0.0350      Main Channel
               100.80         402.90        0.0350      Main Channel
               101.50         402.70        0.0350      Main Channel
               102.30         402.80        0.0350      Main Channel
               103.30         403.20        0.0350      Main Channel
               104.00         403.20        0.0350      Main Channel
               105.60         404.40    0.0350 /0.0550  Main Channel
               109.70         404.30        0.0550
               128.60         404.20        0.0550
               154.10         405.40        0.0550
               179.10         406.70        0.0550
               201.90         408.60        0.0550
               224.20         410.60        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)       (m/s)      (min)
       0.34   403.04    .954E+03       0.3          0.70      47.40
       0.68   403.38    .304E+04       1.6          1.03      32.27
       1.02   403.72    .718E+04       4.5          1.25      26.57
       1.36   404.06    .122E+05       9.7          1.58      20.96
       1.70   404.40    .251E+05      18.1          1.44      23.04
       2.08   404.78    .650E+05      42.3          1.29      25.62
       2.46   405.16    .122E+06      86.3          1.40      23.62
       2.84   405.54    .192E+06     151.6          1.57      21.10
       3.21   405.91    .270E+06     238.3          1.75      18.90
       3.59   406.29    .357E+06     345.8          1.93      17.20
       3.97   406.67    .452E+06     474.9          2.09      15.85
       4.35   407.05    .554E+06     631.1          2.26      14.63
       4.73   407.43    .663E+06     807.8          2.42      13.67
       5.11   407.81    .779E+06    1006.4          2.57      12.89
       5.49   408.19    .902E+06    1229.0          2.71      12.23
       5.86   408.56    .103E+07    1476.4          2.84      11.66
       6.24   408.94    .117E+07    1745.6          2.96      11.18
       6.62   409.32    .132E+07    2034.5          3.07      10.79
       7.00   409.70    .147E+07    2353.2          3.17      10.44

                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
 INFLOW : ID= 2 (  2520)  575.69     3.86    2.93   9.75      0.95      1.19
 OUTFLOW: ID= 1 (  4500)  575.69     3.63    3.40   9.75      0.92      1.17

-------------------------------------------------------------------------------
------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
------------------   U.H. Tp(hrs)=   1.00

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   0.576 (i)
     TIME TO PEAK    (hrs)=   2.733
     RUNOFF VOLUME    (mm)=   7.148
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.198

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   575.69   3.635     3.40     9.75
     + ID2= 2 (  0610):    78.05   0.576     2.73     7.15
       ================================================
       ID = 3 (  2610):   653.74   4.140     3.30     9.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.181 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   6.874
     TOTAL RAINFALL   (mm)=  36.039
```

```
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90       115.77
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.77 (ii)    2.85 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.28
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.03          0.192 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      35.52        17.86          30.22
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.99         0.50           0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        26.23
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.17 (ii)   13.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.04          0.239 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      35.52        10.77          20.67
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.99         0.30           0.57

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.239     1.33    20.67
     + ID2= 2 (  6240):     0.79   0.192     1.33    30.22
       ================================================
       ID = 3 ( 26240):     2.75   0.431     1.33    23.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            0.0000      0.0000  |    0.1390      0.0686
                            0.0060      0.0042  |    0.1510      0.0822
                            0.0130      0.0130  |    0.1630      0.0967
                            0.0200      0.0250  |    0.1730      0.1121
                            0.0250      0.0328  |    0.1780      0.1202
                            0.0290      0.0439  |    2.5750      0.1742
                            0.1260      0.0558  |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)      2.750     0.431      1.33      23.41
   OUTFLOW: ID= 1 ( 46240)      2.750     0.028      2.50      23.35

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.55
                  TIME SHIFT OF PEAK FLOW         (min)= 70.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0417

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        20.42
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.17 (ii)   14.49 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.02          0.058 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      35.52         9.64          14.80
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.99         0.27           0.41

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
```

```
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.2590      0.0708
                          0.0050      0.0089  |    0.2910      0.0871
                          0.0100      0.0187  |    0.3210      0.1045
                          0.0130      0.0298  |    0.3720      0.1438
                          0.0150      0.0422  |    2.8080      0.2087
                          0.2220      0.0559  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)      0.920      0.058      1.33      14.80
   OUTFLOW: ID= 1 ( 46220)      0.920      0.005      3.08      14.32

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.86
                    TIME SHIFT OF PEAK FLOW         (min)=105.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0092

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05         0.43
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        11.91
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       0.77 (ii)   11.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.34         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01         0.010 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.58
     RUNOFF VOLUME    (mm)=      35.52         7.52          8.91
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.99         0.21          0.25

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  ( 26200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 46220):     0.92   0.005     3.08    14.32
      + ID2= 2 ( 46240):     2.75   0.028     2.50    23.35
        ================================================
        ID = 3 ( 26200):     3.67   0.033     2.58    21.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  ( 26200)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 ( 26200):     3.67   0.033     2.58    21.09
      + ID2= 2 (  6230):     0.48   0.010     1.58     8.91
        ================================================
        ID = 1 ( 26200):     4.15   0.039     1.67    19.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0149)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         414.20        0.0350      Main Channel
                  4.30         412.70        0.0350      Main Channel
                  8.60         414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0         0.55       7.70
       0.16   412.86    .182E+02       0.1         0.88       4.85
       0.24   412.94    .410E+02       0.2         1.15       3.70
       0.32   413.02    .729E+02       0.4         1.39       3.05
       0.39   413.09    .114E+03       0.7         1.61       2.63
       0.47   413.17    .164E+03       1.2         1.82       2.33
       0.55   413.25    .223E+03       1.8         2.02       2.10
       0.63   413.33    .292E+03       2.5         2.21       1.92
       0.71   413.41    .369E+03       3.5         2.39       1.78
       0.79   413.49    .456E+03       4.6         2.56       1.66
       0.87   413.57    .551E+03       5.9         2.73       1.56
       0.95   413.65    .656E+03       7.4         2.89       1.47
       1.03   413.73    .770E+03       9.2         3.05       1.39
       1.11   413.81    .893E+03      11.2         3.21       1.32
       1.18   413.88    .103E+04      13.5         3.36       1.27
       1.26   413.96    .117E+04      16.0         3.51       1.21
       1.34   414.04    .132E+04      18.9         3.65       1.16
       1.42   414.12    .148E+04      22.0         3.79       1.12
       1.50   414.20    .165E+04      25.4         3.93       1.08

                                <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 26200)    4.15     0.04    1.67  19.68      0.12      0.69
   OUTFLOW: ID= 1 (  0149)    4.15     0.04    1.83  19.67      0.12      0.69


--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD ( 96211)|   Area    (ha)=   0.61
|ID= 1 DT= 5.0 min |   Total Imp(%)=  58.00   Dir. Conn.(%)=  40.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.26
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        22.50
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       1.90 (ii)   12.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.32         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.01         0.072 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
```

```
     RUNOFF VOLUME    (mm)=      35.04         9.74          19.85
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.97         0.27           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0         0.55        7.70
       0.16   412.86    .182E+02       0.1         0.88        4.85
       0.24   412.94    .410E+02       0.2         1.15        3.70
       0.32   413.02    .729E+02       0.4         1.39        3.05
       0.39   413.09    .114E+03       0.7         1.61        2.63
       0.47   413.17    .164E+03       1.2         1.82        2.33
       0.55   413.25    .223E+03       1.8         2.02        2.10
       0.63   413.33    .292E+03       2.5         2.21        1.92
       0.71   413.41    .369E+03       3.5         2.39        1.78
       0.79   413.49    .456E+03       4.6         2.56        1.66
       0.87   413.57    .551E+03       5.9         2.73        1.56
       0.95   413.65    .656E+03       7.4         2.89        1.47
       1.03   413.73    .770E+03       9.2         3.05        1.39
       1.11   413.81    .893E+03      11.2         3.21        1.32
       1.18   413.88    .103E+04      13.5         3.36        1.27
       1.26   413.96    .117E+04      16.0         3.51        1.21
       1.34   414.04    .132E+04      18.9         3.65        1.16
       1.42   414.12    .148E+04      22.0         3.79        1.12
       1.50   414.20    .165E+04      25.4         3.93        1.08

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 96211)    0.61     0.07    1.33  19.85      0.16      0.89
   OUTFLOW: ID= 1 (  0009)    0.61     0.05    1.42  19.83      0.14      0.77



--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0147)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0149):     4.15   0.039     1.83    19.67
      + ID2= 2 (  0627):     9.39   0.181     1.58     6.87
        ========================================================
        ID = 3 (  0147):    13.54   0.215     1.58    10.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0147)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0147):     13.54   0.215     1.58    10.80
      + ID2= 2 (  0009):      0.61   0.050     1.42    19.83
        ========================================================
        ID = 1 (  0147):     14.15   0.245     1.58    11.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9621)|   Area    (ha)=  16.18
|ID= 1 DT= 5.0 min |   Total Imp(%)=  32.00   Dir. Conn.(%)=  20.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.18        11.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     328.43        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        18.13
               over (min)         5.00        20.00
     Storage Coeff.  (min)=       5.08 (ii)   16.84 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.21         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.69         0.31          0.761 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      35.04         9.49          14.60
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.97         0.26           0.41

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8621)|   Area    (ha)=   4.69
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.69         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     176.82        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      12.22        16.14
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       8.34 (ii)    8.50 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.13         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.00          0.116 (iii)
     TIME TO PEAK    (hrs)=       1.83         1.50           1.83
     RUNOFF VOLUME    (mm)=      11.04         8.32          10.99
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.31         0.23           0.30


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
```

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (8623)	Area (ha)= 2.05			
ID= 1 DT= 5.0 min	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.05	0.00	
Dep. Storage	(mm)=	25.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	116.90	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		13.52	31.35	
over (min)		5.00	10.00	
Storage Coeff. (min)=		6.25 (ii)	6.40 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.19	0.17	
				TOTALS
PEAK FLOW	(cms)=	0.06	0.00	0.056 (iii)
TIME TO PEAK	(hrs)=	1.75	1.42	1.75
RUNOFF VOLUME	(mm)=	11.04	15.03	11.01
TOTAL RAINFALL	(mm)=	36.04	36.04	36.04
RUNOFF COEFFICIENT	=	0.31	0.42	0.31

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (9623)	Area (ha)= 4.42			
ID= 1 DT= 5.0 min	Total Imp(%)= 48.00	Dir. Conn.(%)= 35.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.12	2.30	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	171.66	30.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		106.90	20.27	
over (min)		5.00	15.00	
Storage Coeff. (min)=		3.44 (ii)	14.68 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.26	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.38	0.08	0.407 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.33
RUNOFF VOLUME	(mm)=	35.04	9.96	18.73
TOTAL RAINFALL	(mm)=	36.04	36.04	36.04
RUNOFF COEFFICIENT	=	0.97	0.28	0.52

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 70.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (8624)	Area (ha)= 4.32			
ID= 1 DT= 5.0 min	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.32	0.00	
Dep. Storage	(mm)=	25.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	169.71	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		12.22	16.14	
over (min)		10.00	10.00	
Storage Coeff. (min)=		8.14 (ii)	8.29 (ii)	
Unit Hyd. Tpeak (min)=		10.00	10.00	
Unit Hyd. peak (cms)=		0.13	0.17	
				TOTALS
PEAK FLOW	(cms)=	0.11	0.00	0.108 (iii)
TIME TO PEAK	(hrs)=	1.83	1.42	1.83
RUNOFF VOLUME	(mm)=	11.04	8.32	10.95
TOTAL RAINFALL	(mm)=	36.04	36.04	36.04
RUNOFF COEFFICIENT	=	0.31	0.23	0.30

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 70.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (9624)	Area (ha)= 8.46			
ID= 1 DT= 5.0 min	Total Imp(%)= 51.00	Dir. Conn.(%)= 40.00		

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.31	4.15	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	237.49	30.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		106.90	19.52	
over (min)		5.00	20.00	
Storage Coeff. (min)=		4.18 (ii)	15.60 (ii)	
Unit Hyd. Tpeak (min)=		5.00	20.00	
Unit Hyd. peak (cms)=		0.24	0.07	
				TOTALS
PEAK FLOW	(cms)=	0.78	0.13	0.813 (iii)
TIME TO PEAK	(hrs)=	1.33	1.67	1.33
RUNOFF VOLUME	(mm)=	35.04	9.80	19.89
TOTAL RAINFALL	(mm)=	36.04	36.04	36.04
RUNOFF COEFFICIENT	=	0.97	0.27	0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 70.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0628)	Area (ha)= 5.35			
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 40.00		

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.21	2.14
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00

```
     Length            (m)=     188.86        40.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        28.21
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       3.64 (ii)   15.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.25         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.52         0.10          0.543 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      35.04        11.41          20.86
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.97         0.32           0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8625)|   Area    (ha)=   4.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.11         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     165.53        40.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      12.22        31.35
               over (min)       10.00        10.00
     Storage Coeff.  (min)=       8.02 (ii)    8.17 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.13         0.17
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.00          0.103 (iii)
     TIME TO PEAK    (hrs)=       1.83         1.42           1.83
     RUNOFF VOLUME    (mm)=      11.04        15.03          10.95
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.31         0.42           0.30


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9625)|   Area    (ha)=   8.07
|ID= 1 DT= 5.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  40.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.44         3.63
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     231.95        30.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        27.72
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       4.12 (ii)   14.04 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.24         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.75         0.14          0.797 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      35.04        10.46          20.29
     TOTAL RAINFALL   (mm)=      36.04        36.04          36.04
     RUNOFF COEFFICIENT   =       0.97         0.29           0.56

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0628):     5.35   0.543     1.33    20.86
     + ID2= 2 (  8621):     4.69   0.116     1.83    10.99
       ================================================
       ID = 3 (  2621):    10.04   0.543     1.33    16.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    10.04   0.543     1.33    16.25
     + ID2= 2 (  8623):     2.05   0.056     1.75    11.01
       ================================================
       ID = 1 (  2621):    12.09   0.543     1.33    15.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    12.09   0.543     1.33    15.36
     + ID2= 2 (  8624):     4.32   0.108     1.83    10.95
       ================================================
       ID = 3 (  2621):    16.41   0.543     1.33    14.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    16.41   0.543     1.33    14.20
     + ID2= 2 (  8625):     4.11   0.103     1.83    10.95
       ================================================
       ID = 1 (  2621):    20.52   0.543     1.33    13.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
```

```
        ID1= 1 (  2621):    20.52   0.543     1.33    13.55
      + ID2= 2 (  9621):    16.18   0.761     1.33    14.60
        ================================================
        ID = 3 (  2621):    36.70   1.304     1.33    14.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2621):    36.70   1.304     1.33    14.01
      + ID2= 2 (  9623):     4.42   0.407     1.33    18.73
        ================================================
        ID = 1 (  2621):    41.12   1.711     1.33    14.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2621):    41.12   1.711     1.33    14.52
      + ID2= 2 (  9624):     8.46   0.813     1.33    19.89
        ================================================
        ID = 3 (  2621):    49.58   2.524     1.33    15.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2621):    49.58   2.524     1.33    15.44
      + ID2= 2 (  9625):     8.07   0.797     1.33    20.29
        ================================================
        ID = 1 (  2621):    57.65   3.321     1.33    16.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5621)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    1.5000      2.5000
                          0.0010      0.0000   |    2.5000      3.0000
                          0.0100      1.0000   |    3.0000      3.5000
                          0.0500      1.5000   |    4.0000      4.0000
                          0.5000      2.0000   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2621)     57.650      3.321      1.33      16.12
   OUTFLOW: ID= 1 (  5621)     57.650      0.009      4.75       7.46

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  0.28
                  TIME SHIFT OF PEAK FLOW         (min)=205.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.9186

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  9622)|   Area    (ha)=   6.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  44.00   Dir. Conn.(%)=  30.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.97         3.78
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     212.13        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        20.27
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       3.91 (ii)   15.15 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.25         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.48         0.12          0.509 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67          1.33
     RUNOFF VOLUME    (mm)=      35.04         9.96         17.48
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.97         0.28          0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  8622)|   Area    (ha)=   2.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.99   Dir. Conn.(%)=  99.99
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.20         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      13.52        31.35
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       6.38 (ii)    6.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.18         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.00          0.060 (iii)
     TIME TO PEAK    (hrs)=       1.75         1.42          1.75
     RUNOFF VOLUME    (mm)=      11.04        15.03         11.04
     TOTAL RAINFALL   (mm)=      36.04        36.04         36.04
     RUNOFF COEFFICIENT   =       0.31         0.42          0.31


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  8622):     2.20   0.060     1.75    11.04
      + ID2= 2 (  9622):     6.75   0.509     1.33    17.48
        ================================================
        ID = 3 (  2622):     8.95   0.509     1.33    15.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
```

```
| RESERVOIR(  5622)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.4500      0.2500
                          0.0010      0.0000  |    0.6500      0.3200
                          0.0030      0.1200  |    0.8000      0.4000
                          0.1000      0.1500  |    0.9800      0.5000
                          0.3000      0.2000  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2622)      8.950      0.509      1.33      15.90
   OUTFLOW: ID= 1 (  5622)      8.950      0.033      4.00      14.91

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.45
                  TIME SHIFT OF PEAK FLOW         (min)=160.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1293

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  5621):    57.65   0.009     4.75     7.46
     + ID2= 2 (  5622):     8.95   0.033     4.00    14.91
       ================================================
       ID = 3 (  2625):    66.60   0.042     4.00     8.47

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0150)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0147):    14.15   0.245     1.58    11.19
     + ID2= 2 (  2625):    66.60   0.042     4.00     8.47
       ================================================
       ID = 3 (  0150):    80.75   0.251     1.58     8.94

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0150):    80.75   0.251     1.58     8.94
     + ID2= 2 (  2610):   653.74   4.140     3.30     9.44
       ================================================
       ID = 3 (  2620):   734.49   4.235     3.30     8.99

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.42   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.608

     PEAK FLOW       (cms)=   0.162 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   6.874
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   0.439 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.886
     TOTAL RAINFALL   (mm)=  36.039
     RUNOFF COEFFICIENT   =   0.191

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
                <------ DATA FOR SECTION (   1.1) ------>
                Distance      Elevation       Manning
                    0.00        414.20        0.0350      Main Channel
                    4.30        412.70        0.0350      Main Channel
                    8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17      47.72
       0.16   412.86    .357E+02       0.0          0.28      30.06
       0.24   412.94    .804E+02       0.1          0.36      22.94
       0.32   413.02    .143E+03       0.1          0.44      18.94
       0.39   413.09    .223E+03       0.2          0.51      16.32
       0.47   413.17    .322E+03       0.4          0.58      14.45
       0.55   413.25    .438E+03       0.6          0.64      13.04
       0.63   413.33    .572E+03       0.8          0.70      11.93
       0.71   413.41    .724E+03       1.1          0.76      11.03
       0.79   413.49    .893E+03       1.4          0.81      10.28
       0.87   413.57    .108E+04       1.9          0.86       9.65
       0.95   413.65    .129E+04       2.4          0.92       9.10
       1.03   413.73    .151E+04       2.9          0.97       8.63
       1.11   413.81    .175E+04       3.6          1.01       8.22
       1.18   413.88    .201E+04       4.3          1.06       7.85
       1.26   413.96    .229E+04       5.1          1.11       7.52
       1.34   414.04    .258E+04       6.0          1.15       7.22
       1.42   414.12    .289E+04       6.9          1.20       6.95
       1.50   414.20    .323E+04       8.0          1.24       6.70

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     0.44    1.83   6.89      0.50      0.60
   OUTFLOW: ID= 1 (  4630)   33.04     0.38    2.08   6.88      0.48      0.58



--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):   734.49   4.235     3.30     8.99
     + ID2= 2 (  4630):    33.04   0.384     2.08     6.88
       ================================================
       ID = 3 (  2637):   767.53   4.381     3.27     8.90
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2637)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (2637):	767.53	4.381	3.27	8.90
	+ ID2= 2 (0637):	8.42	0.162	1.58	6.87
	ID = 1 (2637):	775.95	4.407	3.27	8.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0636)	Area (ha)=	3.60	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

Unit Hyd Qpeak (cms)= 0.688

PEAK FLOW (cms)= 0.069 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 6.874
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2636)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2637):	775.95	4.407	3.27	8.88
	+ ID2= 2 (0636):	3.60	0.069	1.58	6.87
	ID = 3 (2636):	779.55	4.418	3.27	8.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0638)	Area (ha)=	20.63	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

Unit Hyd Qpeak (cms)= 3.940

PEAK FLOW (cms)= 0.398 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 6.874
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0639)	Area (ha)=	4.47	Curve Number (CN)=	70.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

Unit Hyd Qpeak (cms)= 0.854

PEAK FLOW (cms)= 0.086 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 6.874
TOTAL RAINFALL (mm)= 36.039
RUNOFF COEFFICIENT = 0.191

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2630)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2636):	779.55	4.418	3.27	8.87
	+ ID2= 2 (0638):	20.63	0.398	1.58	6.87
	ID = 3 (2630):	800.18	4.481	3.27	8.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2630)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (2630):	800.18	4.481	3.27	8.82
	+ ID2= 2 (0639):	4.47	0.086	1.58	6.87
	ID = 1 (2630):	804.65	4.495	3.27	8.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (8709)	Area (ha)=	3.51			
ID= 1 DT= 5.0 min	Total Imp(%)=	100.00	Dir. Conn.(%)=	100.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.51	0.00	
Dep. Storage	(mm)=	25.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	20.00	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		13.52	31.35	
over (min)		5.00	5.00	
Storage Coeff. (min)=		2.17 (ii)	2.32 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.31	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.12	0.00	0.122 (iii)
TIME TO PEAK	(hrs)=	1.67	1.33	1.67
RUNOFF VOLUME	(mm)=	11.04	15.03	11.04
TOTAL RAINFALL	(mm)=	36.04	36.04	36.04
RUNOFF COEFFICIENT	=	0.31	0.42	0.31

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (9709)	Area (ha)=	7.20			
ID= 1 DT= 5.0 min	Total Imp(%)=	56.00	Dir. Conn.(%)=	40.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.03	3.17
Dep. Storage	(mm)=	1.00	1.50

```
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     219.09        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     106.90        28.89
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      3.98 (ii)   13.74 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.24         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.68         0.13          0.720 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=     35.04        10.64          20.40
     TOTAL RAINFALL   (mm)=     36.04        36.04          36.04
     RUNOFF COEFFICIENT   =      0.97         0.30           0.57

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2709)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8709):     3.51   0.122     1.67    11.04
     + ID2= 2 (  9709):     7.20   0.720     1.33    20.40
       ================================================
       ID = 3 (  2709):    10.71   0.720     1.33    17.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5709)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.6000      0.3800
                          0.0010      0.0000   |    0.9000      0.5400
                          0.0100      0.1000   |    1.1000      0.7100
                          0.0500      0.2000   |    1.4000      0.8900
                          0.4000      0.2400   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2709)     10.710      0.720      1.33      17.33
   OUTFLOW: ID= 1 (  5709)     10.710      0.034      4.08      17.33

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.72
                  TIME SHIFT OF PEAK FLOW         (min)=165.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1602

--------------------------------------------------------------------------------

 FINISH
================================================================================================================
==========
----------------------------------------------------------------------------------------------------------------
----------
  ***********************************************
  ** SIMULATION : 5 year Fergus Shand Dam Chica **
  ***********************************************

-------------------
| CHICAGO STORM    |    IDF curve parameters: A=1436.000
| Ptotal= 51.35 mm |                          B=  11.000
-------------------                          C=   0.854
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    =  5.00 min
                        Time to peak ratio =  0.33

     TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
      hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
     0.00    2.55 |  1.00   15.63 |  2.00    9.04 |  3.00    3.62
     0.08    2.73 |  1.08   25.44 |  2.08    8.05 |  3.08    3.45
     0.17    2.95 |  1.17   57.17 |  2.17    7.25 |  3.17    3.29
     0.25    3.21 |  1.25  134.65 |  2.25    6.59 |  3.25    3.15
     0.33    3.53 |  1.33   71.87 |  2.33    6.04 |  3.33    3.02
     0.42    3.91 |  1.42   42.53 |  2.42    5.57 |  3.42    2.90
     0.50    4.38 |  1.50   29.16 |  2.50    5.17 |  3.50    2.79
     0.58    4.99 |  1.58   21.78 |  2.58    4.83 |  3.58    2.69
     0.67    5.80 |  1.67   17.20 |  2.67    4.52 |  3.67    2.59
     0.75    6.91 |  1.75   14.12 |  2.75    4.26 |  3.75    2.51
     0.83    8.53 |  1.83   11.92 |  2.83    4.02 |  3.83    2.42
     0.92   11.09 |  1.92   10.29 |  2.92    3.81 |  3.92    2.35

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   1.784 (i)
     TIME TO PEAK    (hrs)=   2.900
     RUNOFF VOLUME    (mm)=  13.390
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.261

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.297 (i)
     TIME TO PEAK    (hrs)=   2.600
     RUNOFF VOLUME    (mm)=  17.868
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.348

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
```

```
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     121.73        46.70
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.97 (ii)    8.84 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.74         0.40          0.889 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.12
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.297     2.60    17.87
     + ID2= 2 (  0203):     8.20   0.889     1.33    26.12
       ====================================================
       ID = 3 (  2200):    22.80   0.897     1.33    20.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1980      0.2314
                          0.0040      0.0218   |    0.2920      0.2621
                          0.0060      0.0446   |    0.3980      0.2937
                          0.0070      0.0683   |    0.5150      0.3261
                          0.0080      0.0930   |    0.8290      0.3592
                          0.0090      0.1187   |    1.3520      0.3930
                          0.0230      0.1453   |    2.0570      0.4275
                          0.0610      0.1730   |    2.9590      0.4629
                          0.1200      0.2017   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      0.897      1.33      20.84
   OUTFLOW: ID= 1 (  5200)     22.800      0.275      3.43      20.41

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 30.71
                  TIME SHIFT OF PEAK FLOW         (min)=126.00
                  MAXIMUM  STORAGE   USED      (ha.m.)=  0.2567

     **** WARNING : SELECTED ROUTING TIME STEP DENIED.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.335 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  31.834
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.620

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     121.73        46.70
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       0.97 (ii)    8.84 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.022 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.09
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.335     1.83    31.83
     + ID2= 2 (  0206):     0.20   0.022     1.33    26.09
       ====================================================
       ID = 3 (  2201):     5.00   0.342     1.83    31.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.342     1.83    31.60
     + ID2= 2 (  5200):    22.80   0.275     3.43    20.41
       ====================================================
       ID = 1 (  2201):    27.80   0.381     1.93    22.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     121.73        27.44
               over (min)        5.00        14.00
     Storage Coeff.  (min)=       1.19 (ii)   13.93 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=       0.49         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.11         0.125 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.60          1.60
     RUNOFF VOLUME    (mm)=      49.35        15.47         18.18
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.96         0.30          0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     121.73        46.70
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.97 (ii)    8.84 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.06         0.141 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37         26.11
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.96         0.36          0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.141     1.33    26.11
     + ID2= 2 (  0209):     2.70   0.125     1.60    18.18
       ================================================
       ID = 3 (  2202):     4.00   0.240     1.33    20.76

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.240     1.33    20.76
     + ID2= 2 (  2201):    27.80   0.381     1.93    22.43
       ================================================
       ID = 1 (  2202):    31.80   0.517     1.77    22.22

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   1.784     2.90    13.39
     + ID2= 2 (  2202):    31.80   0.517     1.77    22.22
       ================================================
       ID = 3 (  2100):   168.78   2.160     2.90    15.05

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Unit Hyd Qpeak  (cms)=   0.246

    PEAK FLOW       (cms)=   0.101 (i)
    TIME TO PEAK    (hrs)=   1.933
    RUNOFF VOLUME    (mm)=  17.868
    TOTAL RAINFALL   (mm)=  51.355
    RUNOFF COEFFICIENT   =   0.348

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     121.73        46.70
```

```
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.03 (ii)    9.92 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.51         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.40         0.21          0.470 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.12
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.101     1.93    17.87
     + ID2= 2 (  0304):     4.40   0.470     1.33    26.12
       ================================================
       ID = 3 (  2300):     7.30   0.480     1.33    22.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n             =     0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     121.73        46.70
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.03 (ii)    9.92 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.51         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.021 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.33
     RUNOFF VOLUME    (mm)=      49.35        18.37          26.09
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.36           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n             =     0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     121.73        30.89
               over (min)        5.00        12.00
     Storage Coeff.  (min)=       0.97 (ii)   10.90 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=       0.52         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.26          0.301 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.57           1.53
     RUNOFF VOLUME    (mm)=      49.35        15.47          18.18
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.96         0.30           0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.480     1.33    22.84
     + ID2= 2 (  0308):     0.20   0.021     1.33    26.09
       ================================================
       ID = 3 (  2301):     7.50   0.502     1.33    22.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.502     1.33    22.93
     + ID2= 2 (  0310):     5.70   0.301     1.53    18.18
       ================================================
       ID = 1 (  2301):    13.20   0.738     1.37    20.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   2.160     2.90    15.05
     + ID2= 2 (  2301):    13.20   0.738     1.37    20.88
       ================================================
       ID = 3 (  2302):   181.98   2.289     2.80    15.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
```

```
|ID= 1 DT= 2.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      85.06        26.95
               over (min)        16.00        28.00
     Storage Coeff.  (min)=      15.01 (ii)   26.94 (ii)
     Unit Hyd. Tpeak (min)=      16.00        28.00
     Unit Hyd. peak  (cms)=       0.07         0.04
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.39         2.28         2.526 (iii)
     TIME TO PEAK    (hrs)=       1.57         1.87          1.87
     RUNOFF VOLUME    (mm)=      49.35        14.77         15.81
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.96         0.29          0.31

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   2.289     2.80    15.48
     + ID2= 2 (  0400):    82.86   2.526     1.87    15.81
       ================================================
       ID = 3 (  2400):   264.84   4.230     1.93    15.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         411.10        0.0550
                 27.30         410.20        0.0550
                 77.50         409.10        0.0550
                 96.60         409.10        0.0550
                115.80         408.90        0.0550
                124.80         409.10        0.0550
                131.00         408.90    0.0550 /0.0350  Main Channel
                133.60         408.00        0.0350      Main Channel
                134.40         407.60        0.0350      Main Channel
                135.00         407.50        0.0350      Main Channel
                135.80         407.60        0.0350      Main Channel
                136.50         408.00        0.0350      Main Channel
                139.40         408.80    0.0350 /0.0550  Main Channel
                143.50         408.90        0.0550
                148.50         408.70        0.0550
                163.80         408.90        0.0550
                183.20         408.90        0.0550
                243.70         409.70        0.0550
                278.70         410.20        0.0550
                330.50         411.40        0.0550
```

```
<-------------------- TRAVEL TIME TABLE --------------------->
 DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
  (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
 0.19   407.69    .366E+03       0.1          0.51      58.83
 0.37   407.87    .106E+04       0.5          0.81      37.08
 0.56   408.06    .199E+04       1.1          1.00      29.93
 0.74   408.24    .328E+04       2.1          1.14      26.32
 0.93   408.43    .498E+04       3.6          1.28      23.32
 1.11   408.61    .708E+04       5.6          1.43      20.94
 1.30   408.80    .105E+05       8.5          1.45      20.61
 1.49   408.99    .247E+05      14.8          1.07      27.91
 1.68   409.18    .601E+05      30.4          0.91      32.97
 1.87   409.37    .109E+06      58.5          0.96      31.05
 2.06   409.56    .166E+06      98.3          1.06      28.11
 2.25   409.75    .231E+06     150.3          1.17      25.57
 2.44   409.94    .303E+06     215.4          1.28      23.46
 2.64   410.14    .383E+06     293.8          1.38      21.74
 2.83   410.33    .470E+06     390.1          1.49      20.10
 3.02   410.52    .563E+06     502.4          1.60      18.66
 3.21   410.71    .660E+06     628.8          1.71      17.48
 3.40   410.90    .762E+06     769.5          1.81      16.49
 3.59   411.09    .868E+06     924.9          1.91      15.65

                              <---- hydrograph ---->   <-pipe / channel->
                                 AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                 (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
INFLOW : ID= 2 (  2400)  264.84     4.23    1.93  15.58      0.99      1.33
OUTFLOW: ID= 1 (  4400)  264.84     3.70    2.47  15.58      0.94      1.29
```

```
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.135 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.316
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.259

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.09

     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   1.537 (i)
     TIME TO PEAK    (hrs)=   2.750
     RUNOFF VOLUME    (mm)=  16.181
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.315

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
```

```
            <------ DATA FOR SECTION (   1.1) ------>
            Distance      Elevation       Manning
                0.00        414.20        0.0350      Main Channel
                4.30        412.70        0.0350      Main Channel
                8.60        414.20        0.0350      Main Channel

    <---------------------- TRAVEL TIME TABLE ---------------------->
     DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
      (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
     0.08    412.78    .206E+02       0.0          0.19     101.61
     0.16    412.86    .822E+02       0.0          0.30      64.01
     0.24    412.94    .185E+03       0.1          0.39      48.85
     0.32    413.02    .329E+03       0.1          0.48      40.33
     0.39    413.09    .514E+03       0.2          0.55      34.75
     0.47    413.17    .740E+03       0.4          0.62      30.77
     0.55    413.25    .101E+04       0.6          0.69      27.77
     0.63    413.33    .132E+04       0.9          0.75      25.40
     0.71    413.41    .166E+04       1.2          0.82      23.48
     0.79    413.49    .206E+04       1.6          0.88      21.89
     0.87    413.57    .249E+04       2.0          0.93      20.54
     0.95    413.65    .296E+04       2.5          0.99      19.39
     1.03    413.73    .347E+04       3.1          1.04      18.38
     1.11    413.81    .403E+04       3.8          1.10      17.49
     1.18    413.88    .462E+04       4.6          1.15      16.71
     1.26    413.96    .526E+04       5.5          1.20      16.00
     1.34    414.04    .594E+04       6.4          1.25      15.37
     1.42    414.12    .666E+04       7.5          1.30      14.79
     1.50    414.20    .742E+04       8.7          1.34      14.27

                                <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0510)   91.44     1.54    2.75  16.18      0.78      0.87
   OUTFLOW: ID= 1 (  4510)   91.44     1.44    3.08  16.18      0.76      0.86



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.082 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  16.176
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.315

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43        26.43
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     593.69        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        47.10
                 over (min)        5.00        20.00
     Storage Coeff.  (min)=       6.60 (ii)   18.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.18         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       3.97         1.90          4.399 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      50.55        20.33          29.39
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.40           0.57


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        26.22
                 over (min)        5.00        20.00
     Storage Coeff.  (min)=       4.10 (ii)   18.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.24         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.46         0.23          1.514 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      50.55        16.18          31.65
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.32           0.62

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   4.399     1.33    29.39
     + ID2= 2 (  0516):    10.78   1.514     1.33    31.65
       ================================================
       ID = 3 (  2511):    63.65   5.914     1.33    29.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.7700      0.9000   |    3.2130      1.6220
                          1.6000      1.1400   |    3.9540      1.8810
                          2.2900      1.2810   |    4.9000      2.3000
```

```
                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650     5.914     1.33      29.78
   OUTFLOW: ID= 1 (  4511)     63.650     1.450     2.25      29.77

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 24.52
                  TIME SHIFT OF PEAK FLOW         (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.0976
```

```
-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   1.444     3.08    16.18
     + ID2= 2 (  4511):    63.65   1.450     2.25    29.77
       ================================================
       ID = 3 (  2510):   155.09   2.645     2.75    21.76

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   2.645     2.75    21.76
     + ID2= 2 (  0517):     2.14   0.082     1.75    16.18
       ================================================
       ID = 1 (  2510):   157.23   2.667     2.75    21.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        55.63
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       5.41 (ii)   14.33 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.21         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.22         1.12       2.578 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58        1.33
     RUNOFF VOLUME    (mm)=      50.55        20.33       29.39
     TOTAL RAINFALL   (mm)=      51.35        51.35       51.35
     RUNOFF COEFFICIENT   =       0.98         0.40        0.57


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     207.20        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        89.28
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.51 (ii)   12.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.71         0.31       0.822 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58        1.33
     RUNOFF VOLUME    (mm)=      50.55        24.01       33.30
     TOTAL RAINFALL   (mm)=      51.35        51.35       51.35
     RUNOFF COEFFICIENT   =       0.98         0.47        0.65

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=    1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
-------------------          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      0.82      1.33   33.30
     ================================================
     MAJOR SYS.(ID= 2):   0.08      0.09      1.33   33.30
     MINOR SYS.(ID= 3):   6.36      0.73      1.33   33.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   2.578     1.33    29.39
     + ID2= 2 (  8512):     6.36   0.732     1.33    33.30
       ================================================
       ID = 3 (  2512):    33.49   3.310     1.33    30.14

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.6640      0.9151
                          0.0210      0.1601   |    0.8570      1.0220
                          0.0360      0.3317   |    1.0660      1.1320
                          0.0410      0.4218   |    1.2900      1.2450
                          0.1000      0.5147   |    1.5290      1.3610
                          0.2030      0.6105   |    1.7810      1.4800
                          0.3340      0.7092   |    2.0460      1.6020
                          0.4890      0.8107   |    2.3220      1.7260

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     33.489     3.310     1.33      30.14
```

```
   OUTFLOW: ID= 1 (  5512)     33.489      0.395      2.75      30.08

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.92
                  TIME SHIFT OF PEAK FLOW         (min)= 85.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7490

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   2.667     2.75    21.68
     + ID2= 2 (  0515):     5.01   0.135     1.83    13.32
       ================================================
       ID = 3 (  2514):   162.24   2.725     2.67    21.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   2.725     2.67    21.42
     + ID2= 2(   5512):    33.49   0.395     2.75    30.08
       ================================================
       ID = 1 (  2514):   195.73   3.119     2.67    22.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0518)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.288 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  14.288
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.278

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2514):   195.73   3.119     2.67    22.90
     + ID2= 2 (  4400):   264.84   3.699     2.47    15.58
       ================================================
       ID = 3 (  2513):   460.57   6.781     2.57    18.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   460.57   6.781     2.57    18.62
     + ID2= 2 (  0518):     6.68   0.288     1.58    14.29
       ================================================
       ID = 1 (  2513):   467.25   6.841     2.57    18.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   1.486 (i)
     TIME TO PEAK    (hrs)=   2.933
     RUNOFF VOLUME    (mm)=  14.315
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.279

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   467.25   6.841     2.57    18.56
     + ID2= 2 (  0520):   108.36   1.486     2.93    14.32
       ================================================
       ID = 3 (  2520):   575.61   8.252     2.67    17.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------

              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 0.00         409.70        0.0550
                19.70         408.80        0.0550
                41.70         407.20        0.0550
                60.50         405.30        0.0550
                80.00         404.50        0.0550
                95.70         404.60    0.0550 /0.0350  Main Channel
                98.60         403.40        0.0350      Main Channel
               100.40         403.40        0.0350      Main Channel
               100.80         402.90        0.0350      Main Channel
               101.50         402.70        0.0350      Main Channel
               102.30         402.80        0.0350      Main Channel
               103.30         403.20        0.0350      Main Channel
               104.00         403.20        0.0350      Main Channel
               105.60         404.40    0.0350 /0.0550  Main Channel
               109.70         404.30        0.0550
               128.60         404.20        0.0550
               154.10         405.40        0.0550
               179.10         406.70        0.0550
               201.90         408.60        0.0550
               224.20         410.60        0.0550

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)       (cms)         (m/s)      (min)
      0.34   403.04    .954E+03        0.3           0.70       47.40
      0.68   403.38    .304E+04        1.6           1.03       32.27
      1.02   403.72    .718E+04        4.5           1.25       26.57
      1.36   404.06    .122E+05        9.7           1.58       20.96
      1.70   404.40    .251E+05       18.1           1.44       23.04
      2.08   404.78    .650E+05       42.3           1.29       25.62
      2.46   405.16    .122E+06       86.3           1.40       23.62
      2.84   405.54    .192E+06      151.6           1.57       21.10
      3.21   405.91    .270E+06      238.3           1.75       18.90
```

```
       3.59   406.29    .357E+06     345.8          1.93      17.20
       3.97   406.67    .452E+06     474.9          2.09      15.85
       4.35   407.05    .554E+06     631.1          2.26      14.63
       4.73   407.43    .663E+06     807.8          2.42      13.67
       5.11   407.81    .779E+06    1006.4          2.57      12.89
       5.49   408.19    .902E+06    1229.0          2.71      12.23
       5.86   408.56    .103E+07    1476.4          2.84      11.66
       6.24   408.94    .117E+07    1745.6          2.96      11.18
       6.62   409.32    .132E+07    2034.5          3.07      10.79
       7.00   409.70    .147E+07    2353.2          3.17      10.44

                                 <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  2520)  575.61     8.25    2.67  17.76      1.26      1.47
  OUTFLOW: ID= 1 (  4500)  575.61     7.79    3.00  17.76      1.23      1.43



--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.00

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   1.222 (i)
     TIME TO PEAK    (hrs)=   2.700
     RUNOFF VOLUME    (mm)=  14.315
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.279

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   575.61   7.786     3.00    17.76
     + ID2= 2 (  0610):    78.05   1.222     2.70    14.32
       ================================================
       ID = 3 (  2610):   653.66   8.957     2.97    17.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.391 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  13.818
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.269

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6240)|   Area    (ha)=   0.79

|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65       192.97
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.70 (ii)    2.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.05          0.253 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      50.83        30.46         44.72
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.99         0.59          0.87

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        60.16
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.06 (ii)    9.71 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.08          0.329 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      50.83        20.46         32.60
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.99         0.40          0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.329     1.33    32.60
     + ID2= 2 (  6240):     0.79   0.253     1.33    44.72
       ================================================
```

```
        ID = 3 ( 26240):     2.75   0.582     1.33    36.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1390      0.0686
                          0.0060      0.0042   |    0.1510      0.0822
                          0.0130      0.0130   |    0.1630      0.0967
                          0.0200      0.0250   |    0.1730      0.1121
                          0.0250      0.0328   |    0.1780      0.1202
                          0.0290      0.0439   |    2.5750      0.1742
                          0.1260      0.0558   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)      2.750     0.582      1.33      36.09
   OUTFLOW: ID= 1 ( 46240)      2.750     0.118      1.75      36.02

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.32
                  TIME SHIFT OF PEAK FLOW         (min)= 25.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0550

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37        0.55
     Dep. Storage     (mm)=       0.52        7.16
     Average Slope     (%)=       2.00        2.00
     Length            (m)=      40.00       40.00
     Mannings n           =      0.013       0.250

     Max.Eff.Inten.(mm/hr)=     134.65       48.06
               over (min)        5.00       15.00
     Storage Coeff.  (min)=       1.06 (ii)   10.52 (ii)
     Unit Hyd. Tpeak (min)=       5.00       15.00
     Unit Hyd. peak  (cms)=       0.34        0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.07        0.04         0.080 (iii)
     TIME TO PEAK    (hrs)=       1.33        1.58          1.33
     RUNOFF VOLUME    (mm)=      50.83       18.73         25.14
     TOTAL RAINFALL   (mm)=      51.35       51.35         51.35
     RUNOFF COEFFICIENT   =       0.99        0.36          0.49

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.2590      0.0708
                          0.0050      0.0089   |    0.2910      0.0871
                          0.0100      0.0187   |    0.3210      0.1045
                          0.0130      0.0298   |    0.3720      0.1438
                          0.0150      0.0422   |    2.8080      0.2087
                          0.2220      0.0559   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)      0.920     0.080      1.33      25.14
   OUTFLOW: ID= 1 ( 46220)      0.920     0.009      2.83      24.65

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.87
                  TIME SHIFT OF PEAK FLOW         (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0162

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05        0.43
     Dep. Storage     (mm)=       0.52        7.16
     Average Slope     (%)=       2.00        2.00
     Length            (m)=      20.00       20.00
     Mannings n           =      0.013       0.250

     Max.Eff.Inten.(mm/hr)=     134.65       29.87
               over (min)        5.00       10.00
     Storage Coeff.  (min)=       0.70 (ii)    8.25 (ii)
     Unit Hyd. Tpeak (min)=       5.00       10.00
     Unit Hyd. peak  (cms)=       0.34        0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01        0.02         0.028 (iii)
     TIME TO PEAK    (hrs)=       1.33        1.50          1.50
     RUNOFF VOLUME    (mm)=      50.83       15.39         17.15
     TOTAL RAINFALL   (mm)=      51.35       51.35         51.35
     RUNOFF COEFFICIENT   =       0.99        0.30          0.33

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26200)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.009     2.83    24.65
     + ID2= 2 ( 46240):     2.75   0.118     1.75    36.02
       ================================================
       ID = 3 ( 26200):     3.67   0.125     1.83    33.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26200)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 ( 26200):     3.67   0.125     1.83    33.17
     + ID2= 2 (  6230):     0.48   0.028     1.50    17.15
       ================================================
       ID = 1 ( 26200):     4.15   0.142     1.75    31.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  0149)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55       7.70
       0.16   412.86    .182E+02       0.1          0.88       4.85
       0.24   412.94    .410E+02       0.2          1.15       3.70
       0.32   413.02    .729E+02       0.4          1.39       3.05
       0.39   413.09    .114E+03       0.7          1.61       2.63
       0.47   413.17    .164E+03       1.2          1.82       2.33
       0.55   413.25    .223E+03       1.8          2.02       2.10
       0.63   413.33    .292E+03       2.5          2.21       1.92
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                 <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 26200)    4.15     0.14    1.75  31.32      0.21      1.04
   OUTFLOW: ID= 1 (  0149)    4.15     0.14    1.83  31.32      0.21      1.03



--------------------
| CALIB            |
| STANDHYD ( 96211)|   Area    (ha)=   0.61
|ID= 1 DT= 5.0 min |   Total Imp(%)=  58.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.26
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        50.88
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.73 (ii)    9.51 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.02        0.099 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50         1.33
     RUNOFF VOLUME    (mm)=      50.35        18.46        31.21
     TOTAL RAINFALL   (mm)=      51.35        51.35        51.35
     RUNOFF COEFFICIENT   =       0.98         0.36         0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
```

```
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55       7.70
       0.16   412.86    .182E+02       0.1          0.88       4.85
       0.24   412.94    .410E+02       0.2          1.15       3.70
       0.32   413.02    .729E+02       0.4          1.39       3.05
       0.39   413.09    .114E+03       0.7          1.61       2.63
       0.47   413.17    .164E+03       1.2          1.82       2.33
       0.55   413.25    .223E+03       1.8          2.02       2.10
       0.63   413.33    .292E+03       2.5          2.21       1.92
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                 <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 96211)    0.61     0.10    1.33  31.21      0.18      0.94
   OUTFLOW: ID= 1 (  0009)    0.61     0.08    1.42  31.18      0.17      0.91



--------------------
| ADD HYD  (  0147)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0149):     4.15   0.141     1.83    31.32
     + ID2= 2 (  0627):     9.39   0.391     1.58    13.82
       ================================================
       ID = 3 (  0147):    13.54   0.495     1.67    19.18

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| ADD HYD  (  0147)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0147):    13.54   0.495     1.67    19.18
     + ID2= 2 (  0009):     0.61   0.083     1.42    31.18
       ================================================
       ID = 1 (  0147):    14.15   0.539     1.58    19.70

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  9621)|   Area    (ha)=  16.18
|ID= 1 DT= 5.0 min |   Total Imp(%)=  32.00   Dir. Conn.(%)=  20.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.18        11.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     328.43        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        39.69
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       4.63 (ii)   13.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.22         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.94         0.67         1.166 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.42
     RUNOFF VOLUME    (mm)=      50.35        17.59         24.14
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.98         0.34          0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8621)|   Area    (ha)=   4.69
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.69         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      65.35        29.63
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.15 (ii)    1.24 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.33
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.84         0.00          0.840 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      26.35        15.66         26.35
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.51         0.30          0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8623)|   Area    (ha)=   2.05
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.05         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      65.35        53.54
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.15 (ii)    1.24 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.33
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.37         0.00          0.367 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      26.35        26.25         26.35
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.51         0.51          0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9623)|   Area    (ha)=   4.42
|ID= 1 DT= 5.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  35.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.12         2.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     171.66        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        44.18
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.14 (ii)   11.37 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.27         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.50         0.17          0.559 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      50.35        18.33         29.54
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.98         0.36          0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8624)|   Area    (ha)=   4.32
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.32         0.00
     Dep. Storage     (mm)=      25.00         1.50
```

```
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      65.35        29.63
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.15 (ii)    1.24 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.33
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.77         0.00          0.774 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      26.35        15.66         26.35
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.51         0.30          0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9624)|   Area    (ha)=   8.46
|ID= 1 DT= 5.0 min |   Total Imp(%)=  51.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.31         4.15
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     237.49        30.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        42.61
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.81 (ii)   12.17 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.25         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.05         0.28          1.136 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      50.35        18.08         30.99
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.98         0.35          0.60

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0628)|   Area    (ha)=   5.35
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.21         2.14
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     188.86        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        60.60
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.32 (ii)   11.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.69         0.21          0.757 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      50.35        20.63         32.52
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.98         0.40          0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8625)|   Area    (ha)=   4.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.11         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      65.35        53.54
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.15 (ii)    1.24 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.33
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.74         0.00          0.736 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      26.35        26.25         26.35
     TOTAL RAINFALL   (mm)=      51.35        51.35         51.35
     RUNOFF COEFFICIENT   =       0.51         0.51          0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9625)|   Area    (ha)=   8.07
|ID= 1 DT= 5.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.44         3.63
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     231.95        30.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        49.47
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.76 (ii)   11.63 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.25         0.09
                                                        *TOTALS*
```

```
     PEAK FLOW       (cms)=       1.00         0.29          1.097 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      50.35        19.13          31.62
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.37           0.62

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0628):     5.35   0.757     1.33    32.52
     + ID2= 2 (  8621):     4.69   0.840     1.42    26.35
       ================================================
       ID = 3 (  2621):    10.04   1.461     1.42    29.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    10.04   1.461     1.42    29.64
     + ID2= 2 (  8623):     2.05   0.367     1.42    26.35
       ================================================
       ID = 1 (  2621):    12.09   1.828     1.42    29.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    12.09   1.828     1.42    29.08
     + ID2= 2 (  8624):     4.32   0.774     1.42    26.35
       ================================================
       ID = 3 (  2621):    16.41   2.602     1.42    28.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    16.41   2.602     1.42    28.36
     + ID2= 2 (  8625):     4.11   0.736     1.42    26.35
       ================================================
       ID = 1 (  2621):    20.52   3.338     1.42    27.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    20.52   3.338     1.42    27.96
     + ID2= 2 (  9621):    16.18   1.166     1.42    24.14
       ================================================
       ID = 3 (  2621):    36.70   4.504     1.42    26.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    36.70   4.504     1.42    26.28
     + ID2= 2 (  9623):     4.42   0.559     1.33    29.54
       ================================================
       ID = 1 (  2621):    41.12   4.960     1.42    26.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    41.12   4.960     1.42    26.63
     + ID2= 2 (  9624):     8.46   1.136     1.33    30.99
       ================================================
       ID = 3 (  2621):    49.58   5.915     1.42    27.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    49.58   5.915     1.42    27.37
     + ID2= 2 (  9625):     8.07   1.097     1.33    31.62
       ================================================
       ID = 1 (  2621):    57.65   6.842     1.42    27.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5621)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    1.5000      2.5000
                          0.0010      0.0000   |    2.5000      3.0000
                          0.0100      1.0000   |    3.0000      3.5000
                          0.0500      1.5000   |    4.0000      4.0000
                          0.5000      2.0000   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2621)     57.650      6.842      1.42      27.97
   OUTFLOW: ID= 1 (  5621)     57.650      0.104      4.17      16.14

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.53
                TIME SHIFT OF PEAK FLOW         (min)=165.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.5607

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  9622)|   Area    (ha)=   6.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  44.00   Dir. Conn.(%)=  30.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.97         3.78
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     212.13        30.00
```

```
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.65        44.18
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.56 (ii)   11.80 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.64         0.27          0.726 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      50.35        18.33          27.94
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.98         0.36           0.54

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8622)|   Area    (ha)=   2.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.99   Dir. Conn.(%)=  99.99
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.20         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      65.35        53.54
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.15 (ii)    1.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.33
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.39         0.00          0.394 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33           1.42
     RUNOFF VOLUME    (mm)=      26.35        26.25          26.35
     TOTAL RAINFALL   (mm)=      51.35        51.35          51.35
     RUNOFF COEFFICIENT   =       0.51         0.51           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8622):     2.20   0.394     1.42    26.35
     + ID2= 2 (  9622):     6.75   0.726     1.33    27.94
       ================================================
       ID = 3 (  2622):     8.95   1.029     1.42    27.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5622)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.4500      0.2500
                          0.0010      0.0000   |    0.6500      0.3200
                          0.0030      0.1200   |    0.8000      0.4000
                          0.1000      0.1500   |    0.9800      0.5000
                          0.3000      0.2000   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2622)      8.950      1.029      1.42      27.55
   OUTFLOW: ID= 1 (  5622)      8.950      0.160      2.33      26.54

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.56
                  TIME SHIFT OF PEAK FLOW         (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1652

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  5621):    57.65   0.104     4.17    16.14
     + ID2= 2 (  5622):     8.95   0.160     2.33    26.54
       ================================================
       ID = 3 (  2625):    66.60   0.192     2.42    17.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0150)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0147):    14.15   0.539     1.58    19.70
     + ID2= 2 (  2625):    66.60   0.192     2.42    17.54
       ================================================
       ID = 3 (  0150):    80.75   0.574     1.75    17.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0150):    80.75   0.574     1.75    17.91
     + ID2= 2 (  2610):   653.66   8.957     2.97    17.34
       ================================================
       ID = 3 (  2620):   734.41   9.247     2.93    16.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.42   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.608

     PEAK FLOW       (cms)=   0.350 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  13.818
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.269

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
-------------------
| CALIB           |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   0.956 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  13.842
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17      47.72
       0.16   412.86    .357E+02       0.0          0.28      30.06
       0.24   412.94    .804E+02       0.1          0.36      22.94
       0.32   413.02    .143E+03       0.1          0.44      18.94
       0.39   413.09    .223E+03       0.2          0.51      16.32
       0.47   413.17    .322E+03       0.4          0.58      14.45
       0.55   413.25    .438E+03       0.6          0.64      13.04
       0.63   413.33    .572E+03       0.8          0.70      11.93
       0.71   413.41    .724E+03       1.1          0.76      11.03
       0.79   413.49    .893E+03       1.4          0.81      10.28
       0.87   413.57    .108E+04       1.9          0.86       9.65
       0.95   413.65    .129E+04       2.4          0.92       9.10
       1.03   413.73    .151E+04       2.9          0.97       8.63
       1.11   413.81    .175E+04       3.6          1.01       8.22
       1.18   413.88    .201E+04       4.3          1.06       7.85
       1.26   413.96    .229E+04       5.1          1.11       7.52
       1.34   414.04    .258E+04       6.0          1.15       7.22
       1.42   414.12    .289E+04       6.9          1.20       6.95
       1.50   414.20    .323E+04       8.0          1.24       6.70

                                 <---- hydrograph ---->   <-pipe / channel->
                                   AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                   (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     0.96    1.83  13.84      0.67      0.73
   OUTFLOW: ID= 1 (  4630)   33.04     0.87    2.00  13.83      0.65      0.71


--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):   734.41   9.247     2.93    16.92
     + ID2= 2 (  4630):    33.04   0.866     2.00    13.83
       ================================================
       ID = 3 (  2637):   767.45   9.625     2.90    16.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   767.45   9.625     2.90    16.78
     + ID2= 2 (  0637):     8.42   0.350     1.58    13.82
       ================================================
       ID = 1 (  2637):   775.87   9.680     2.90    16.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0636)|   Area    (ha)=   3.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.688

     PEAK FLOW       (cms)=   0.150 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  13.818
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.269

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   775.87   9.680     2.90    16.75
     + ID2= 2 (  0636):     3.60   0.150     1.58    13.82
       ================================================
       ID = 3 (  2636):   779.47   9.703     2.90    16.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   3.940

     PEAK FLOW       (cms)=   0.859 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  13.818
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.269

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0639)|   Area    (ha)=   4.47   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.854

     PEAK FLOW       (cms)=   0.186 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  13.818
     TOTAL RAINFALL   (mm)=  51.355
     RUNOFF COEFFICIENT   =   0.269
```

```
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   779.47   9.703     2.90    16.74
     + ID2= 2 (  0638):    20.63   0.859     1.58    13.82
       ================================================
       ID = 3 (  2630):   800.10   9.839     2.87    16.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   800.10   9.839     2.87    16.66
     + ID2= 2 (  0639):     4.47   0.186     1.58    13.82
       ================================================
       ID = 1 (  2630):   804.57   9.869     2.87    16.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8709)|   Area    (ha)=   3.51
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.51         0.00
     Dep. Storage     (mm)=     25.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     20.00        40.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     65.35        53.54
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      1.15 (ii)    1.24 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.34         0.33
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.63         0.00          0.629 (iii)
     TIME TO PEAK    (hrs)=      1.42         1.33           1.42
     RUNOFF VOLUME    (mm)=     26.35        26.25          26.35
     TOTAL RAINFALL   (mm)=     51.35        51.35          51.35
     RUNOFF COEFFICIENT   =      0.51         0.51           0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9709)|   Area    (ha)=   7.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  40.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.03         3.17
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=    219.09        30.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=    134.65        51.44
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      3.63 (ii)   11.38 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.25         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.90         0.27          0.991 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=     50.35        19.41          31.79
     TOTAL RAINFALL   (mm)=     51.35        51.35          51.35
     RUNOFF COEFFICIENT   =      0.98         0.38           0.62

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2709)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8709):     3.51   0.629     1.42    26.35
     + ID2= 2 (  9709):     7.20   0.991     1.33    31.79
       ================================================
       ID = 3 (  2709):    10.71   1.460     1.42    30.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5709)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.6000      0.3800
                           0.0010      0.0000   |    0.9000      0.5400
                           0.0100      0.1000   |    1.1000      0.7100
                           0.0500      0.2000   |    1.4000      0.8900
                           0.4000      0.2400   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2709)     10.710      1.460      1.42      30.01
   OUTFLOW: ID= 1 (  5709)     10.710      0.220      2.25      30.01

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.09
                TIME SHIFT OF PEAK FLOW         (min)= 50.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.2196

--------------------------------------------------------------------------------

 FINISH
================================================================================
----------
  ***********************************************
  ** SIMULATION : 10 year Fergus Shand Dam Chic **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2126.000
| Ptotal= 61.34 mm |                          B=  15.000
--------------------                          C=   0.890
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  4.00 hrs
```

```
                    Storm time step    =  5.00 min
                    Time to peak ratio =  0.33

 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.00    2.71 |  1.00   19.98 |  2.00   11.15 |  3.00    4.04
 0.08    2.94 |  1.08   32.79 |  2.08    9.83 |  3.08    3.82
 0.17    3.21 |  1.17   70.46 |  2.17    8.76 |  3.17    3.63
 0.25    3.53 |  1.25  147.79 |  2.25    7.89 |  3.25    3.45
 0.33    3.92 |  1.33   87.01 |  2.33    7.16 |  3.33    3.29
 0.42    4.40 |  1.42   53.99 |  2.42    6.55 |  3.42    3.14
 0.50    5.01 |  1.50   37.57 |  2.50    6.03 |  3.50    3.01
 0.58    5.79 |  1.58   28.09 |  2.58    5.58 |  3.58    2.89
 0.67    6.84 |  1.67   22.06 |  2.67    5.19 |  3.67    2.77
 0.75    8.31 |  1.75   17.96 |  2.75    4.84 |  3.75    2.67
 0.83   10.47 |  1.83   15.02 |  2.83    4.54 |  3.83    2.57
 0.92   13.90 |  1.92   12.83 |  2.92    4.27 |  3.92    2.48


-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=   2.537 (i)
     TIME TO PEAK    (hrs)=   2.900
     RUNOFF VOLUME    (mm)=  18.624
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.304

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   0.407 (i)
     TIME TO PEAK    (hrs)=   2.600
     RUNOFF VOLUME    (mm)=  24.021
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     134.90        61.46
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    8.48 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.82         0.55          1.033 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.49
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.407     2.60    24.02
     + ID2= 2 (  0203):     8.20   1.033     1.33    33.49
       ================================================
       ID = 3 (  2200):    22.80   1.049     1.37    27.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.1980      0.2314
                          0.0040      0.0218  |    0.2920      0.2621
                          0.0060      0.0446  |    0.3980      0.2937
                          0.0070      0.0683  |    0.5150      0.3261
                          0.0080      0.0930  |    0.8290      0.3592
                          0.0090      0.1187  |    1.3520      0.3930
                          0.0230      0.1453  |    2.0570      0.4275
                          0.0610      0.1730  |    2.9590      0.4629
                          0.1200      0.2017  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.049      1.37      27.43
   OUTFLOW: ID= 1 (  5200)     22.800      0.410      3.20      27.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 39.04
                  TIME SHIFT OF PEAK FLOW         (min)=110.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2969

     **** WARNING : SELECTED ROUTING TIME STEP DENIED.
-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.433 (i)
```

```
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.665
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.663

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=     134.90        61.46
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    8.48 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.025 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.46
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.433     1.83    40.67
     + ID2= 2 (  0206):     0.20   0.025     1.33    33.46
       ====================================================
       ID = 3 (  2201):     5.00   0.443     1.83    40.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.443     1.83    40.38
     + ID2= 2 (  5200):    22.80   0.410     3.20    27.00
       ====================================================
       ID = 1 (  2201):    27.80   0.579     2.03    29.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     134.90        38.92
                over (min)        5.00        14.00
     Storage Coeff.  (min)=       1.14 (ii)   12.22 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=       0.50         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.16          0.180 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.60           1.60
     RUNOFF VOLUME    (mm)=      59.34        21.28          24.32
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.35           0.40

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     134.90        61.46
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    8.48 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.09          0.164 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.48
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
-------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.164     1.33    33.48
     + ID2= 2 (  0209):     2.70   0.180     1.60    24.32
       ================================================
       ID = 3 (  2202):     4.00   0.310     1.53    27.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.310     1.53    27.30
     + ID2= 2 (  2201):    27.80   0.579     2.03    29.40
       ================================================
       ID = 1 (  2202):    31.80   0.738     1.83    29.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   2.537     2.90    18.62
     + ID2= 2 (  2202):    31.80   0.738     1.83    29.14
       ================================================
       ID = 3 (  2100):   168.78   3.098     2.83    20.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.138 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  24.021
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     134.90        61.46
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.99 (ii)    8.96 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.51         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.44         0.29          0.549 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.49
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.138     1.93    24.02
     + ID2= 2 (  0304):     4.40   0.549     1.33    33.49
       ================================================
       ID = 3 (  2300):     7.30   0.570     1.37    29.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     134.90        61.46
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.99 (ii)    8.96 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.51         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.025 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.33
     RUNOFF VOLUME    (mm)=      59.34        24.87          33.46
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.41           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     134.90        41.38
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    9.77 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.37          0.435 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.50
     RUNOFF VOLUME    (mm)=      59.34        21.28          24.32
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.35           0.40

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2300):     7.30   0.570     1.37    29.73
      + ID2= 2 (  0308):     0.20   0.025     1.33    33.46
        ================================================
        ID = 3 (  2301):     7.50   0.595     1.37    29.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2301):     7.50   0.595     1.37    29.83
      + ID2= 2 (  0310):     5.70   0.435     1.50    24.32
        ================================================
        ID = 1 (  2301):    13.20   0.984     1.47    27.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2100):   168.78   3.098     2.83    20.60
      + ID2= 2 (  2301):    13.20   0.984     1.47    27.45
        ================================================
        ID = 3 (  2302):   181.98   3.268     2.77    21.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 2.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29         74.57
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=       0.70          2.00
     Length            (m)=    1437.00         40.00
     Mannings n           =      0.013         0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     102.81        36.51
               over (min)       14.00        26.00
     Storage Coeff.  (min)=      13.91 (ii)   24.48 (ii)
     Unit Hyd. Tpeak (min)=      14.00        26.00
     Unit Hyd. peak  (cms)=       0.08         0.05
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.48         3.40          3.702 (iii)
     TIME TO PEAK    (hrs)=       1.53         1.83           1.83
     RUNOFF VOLUME    (mm)=      59.34        20.39          21.56
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.97         0.33           0.35

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2302):   181.98   3.268     2.77    21.10
      + ID2= 2 (  0400):    82.86   3.702     1.83    21.56
        ================================================
        ID = 3 (  2400):   264.84   6.064     1.90    21.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                 0.00         411.10        0.0550
                27.30         410.20        0.0550
                77.50         409.10        0.0550
                96.60         409.10        0.0550
               115.80         408.90        0.0550
               124.80         409.10        0.0550
               131.00         408.90    0.0550 /0.0350  Main Channel
               133.60         408.00        0.0350      Main Channel
               134.40         407.60        0.0350      Main Channel
               135.00         407.50        0.0350      Main Channel
               135.80         407.60        0.0350      Main Channel
               136.50         408.00        0.0350      Main Channel
               139.40         408.80    0.0350 /0.0550  Main Channel
               143.50         408.90        0.0550
               148.50         408.70        0.0550
               163.80         408.90        0.0550
               183.20         408.90        0.0550
               243.70         409.70        0.0550
               278.70         410.20        0.0550
               330.50         411.40        0.0550
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.19	407.69	.366E+03	0.1	0.51	58.83
0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66
3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2	(2400)	264.84	6.06	1.90	21.24	1.14	1.43
OUTFLOW: ID= 1	(4400)	264.84	5.33	2.33	21.24	1.08	1.40

CALIB					
NASHYD	(0515)	Area	(ha)= 5.01	Curve Number	(CN)= 65.0
ID= 1 DT= 5.0 min		Ia	(mm)= 1.50	# of Linear Res.	(N)= 3.00
		U.H. Tp(hrs)= 0.41			

Unit Hyd Qpeak (cms)= 0.467

PEAK FLOW (cms)= 0.187 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 18.213
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.297

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD	(0510)	Area	(ha)= 91.44	Curve Number	(CN)= 71.0
ID= 1 DT= 5.0 min		Ia	(mm)= 1.50	# of Linear Res.	(N)= 3.00
		U.H. Tp(hrs)= 1.09			

Unit Hyd Qpeak (cms)= 3.204

PEAK FLOW (cms)= 2.120 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 21.892
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.357

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN	(4510)		
IN= 2---> OUT= 1		Routing time step (min)'	= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.206E+02	0.0	0.19	101.61
0.16	412.86	.822E+02	0.0	0.30	64.01
0.24	412.94	.185E+03	0.1	0.39	48.85
0.32	413.02	.329E+03	0.1	0.48	40.33
0.39	413.09	.514E+03	0.2	0.55	34.75
0.47	413.17	.740E+03	0.4	0.62	30.77
0.55	413.25	.101E+04	0.6	0.69	27.77
0.63	413.33	.132E+04	0.9	0.75	25.40
0.71	413.41	.166E+04	1.2	0.82	23.48
0.79	413.49	.206E+04	1.6	0.88	21.89
0.87	413.57	.249E+04	2.0	0.93	20.54
0.95	413.65	.296E+04	2.5	0.99	19.39
1.03	413.73	.347E+04	3.1	1.04	18.38
1.11	413.81	.403E+04	3.8	1.10	17.49
1.18	413.88	.462E+04	4.6	1.15	16.71
1.26	413.96	.526E+04	5.5	1.20	16.00
1.34	414.04	.594E+04	6.4	1.25	15.37
1.42	414.12	.666E+04	7.5	1.30	14.79
1.50	414.20	.742E+04	8.7	1.34	14.27

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2	(0510)	91.44	2.12	2.75	21.89	0.88	0.94
OUTFLOW: ID= 1	(4510)	91.44	2.01	3.00	21.89	0.86	0.93

CALIB					
NASHYD	(0517)	Area	(ha)= 2.14	Curve Number	(CN)= 71.0
ID= 1 DT= 5.0 min		Ia	(mm)= 1.50	# of Linear Res.	(N)= 3.00
		U.H. Tp(hrs)= 0.32			

Unit Hyd Qpeak (cms)= 0.255

PEAK FLOW (cms)= 0.113 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 21.885
TOTAL RAINFALL (mm)= 61.344
RUNOFF COEFFICIENT = 0.357

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD	(0511)	Area	(ha)= 52.87		
ID= 1 DT= 5.0 min		Total Imp(%)= 50.00		Dir. Conn.(%)=	30.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	26.43	26.43
Dep. Storage	(mm)=	0.80	1.50
Average Slope	(%)=	1.00	1.00
Length	(m)=	593.69	40.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		147.79	71.37
over (min)		5.00	20.00
Storage Coeff. (min)=		6.36 (ii)	16.31 (ii)
Unit Hyd. Tpeak (min)=		5.00	20.00
Unit Hyd. peak (cms)=		0.18	0.06

```
                                                        *TOTALS*
     PEAK FLOW       (cms)=       4.54         2.68          5.388 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.42
     RUNOFF VOLUME    (mm)=      60.54        27.03          37.09
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.44           0.60


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        34.87
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       3.95 (ii)   17.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.24         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.65         0.33          1.726 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      60.54        21.89          39.28
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.36           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   5.388     1.42    37.09
     + ID2= 2 (  0516):    10.78   1.726     1.33    39.28
       ================================================
       ID = 3 (  2511):    63.65   6.912     1.33    37.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                          0.7700      0.9000   |    3.2130      1.6220
                          1.6000      1.1400   |    3.9540      1.8810
                          2.2900      1.2810   |    4.9000      2.3000

                               AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650      6.912      1.33      37.46
   OUTFLOW: ID= 1 (  4511)     63.650      2.331      2.17      37.45

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 33.73
                  TIME SHIFT OF PEAK FLOW         (min)= 50.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.2977

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   2.008     3.00    21.89
     + ID2= 2 (  4511):    63.65   2.331     2.17    37.45
       ================================================
       ID = 3 (  2510):   155.09   3.740     2.50    28.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   3.740     2.50    28.27
     + ID2= 2 (  0517):     2.14   0.113     1.75    21.88
       ================================================
       ID = 1 (  2510):   157.23   3.782     2.50    28.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        71.37
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       5.21 (ii)   13.29 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.21         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       2.53         1.54          3.164 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.42
     RUNOFF VOLUME    (mm)=      60.54        27.03          37.09
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.44           0.60


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     207.20        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79       112.86
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.38 (ii)   11.66 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.80         0.43         0.953 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      60.54        31.48         41.65
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.99         0.51          0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      0.95      1.33   41.65
     ====================================================
     MAJOR SYS.(ID= 2):   0.33      0.22      1.33   41.65
     MINOR SYS.(ID= 3):   6.11      0.73      1.33   41.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   3.164     1.42    37.09
     + ID2= 2 (  8512):     6.11   0.732     1.33    41.65
       ================================================
       ID = 3 (  2512):    33.24   3.896     1.42    37.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.6640      0.9151
                          0.0210      0.1601   |    0.8570      1.0220
                          0.0360      0.3317   |    1.0660      1.1320
                          0.0410      0.4218   |    1.2900      1.2450
                          0.1000      0.5147   |    1.5290      1.3610
                          0.2030      0.6105   |    1.7810      1.4800
                          0.3340      0.7092   |    2.0460      1.6020
                          0.4890      0.8107   |    2.3220      1.7260

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     33.244      3.896      1.42      37.93
   OUTFLOW: ID= 1 (  5512)     33.244      0.628      2.50      37.87

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.12
                    TIME SHIFT OF PEAK FLOW         (min)= 65.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.8939

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   3.782     2.50    28.19
     + ID2= 2 (  0515):     5.01   0.187     1.83    18.21
       ================================================
       ID = 3 (  2514):   162.24   3.886     2.50    27.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   3.886     2.50    27.88
     + ID2= 2 (  5512):    33.24   0.628     2.50    37.87
       ================================================
       ID = 1 (  2514):   195.48   4.515     2.50    29.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0518)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.405 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.792
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2514):   195.48   4.515     2.50    29.58
     + ID2= 2 (  4400):   264.84   5.328     2.33    21.24
       ================================================
       ID = 3 (  2513):   460.32   9.819     2.43    24.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   460.32   9.819     2.43    24.71
     + ID2= 2 (  0518):     6.68   0.405     1.58    19.79
       ================================================
       ID = 1 (  2513):   467.00   9.921     2.40    24.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.20

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   2.104 (i)
     TIME TO PEAK    (hrs)=   2.933
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   467.00   9.921     2.40    24.64
     + ID2= 2 (  0520):   108.36   2.104     2.93    19.83
       ==========================================================
       ID = 3 (  2520):   575.36  11.801     2.50    23.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         409.70        0.0550
                  19.70         408.80        0.0550
                  41.70         407.20        0.0550
                  60.50         405.30        0.0550
                  80.00         404.50        0.0550
                  95.70         404.60    0.0550 /0.0350  Main Channel
                  98.60         403.40        0.0350      Main Channel
                 100.40         403.40        0.0350      Main Channel
                 100.80         402.90        0.0350      Main Channel
                 101.50         402.70        0.0350      Main Channel
                 102.30         402.80        0.0350      Main Channel
                 103.30         403.20        0.0350      Main Channel
                 104.00         403.20        0.0350      Main Channel
                 105.60         404.40    0.0350 /0.0550  Main Channel
                 109.70         404.30        0.0550
                 128.60         404.20        0.0550
                 154.10         405.40        0.0550
                 179.10         406.70        0.0550
                 201.90         408.60        0.0550
                 224.20         410.60        0.0550

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)       (m/s)      (min)
       0.34    403.04    .954E+03       0.3         0.70      47.40
       0.68    403.38    .304E+04       1.6         1.03      32.27
       1.02    403.72    .718E+04       4.5         1.25      26.57
       1.36    404.06    .122E+05       9.7         1.58      20.96
       1.70    404.40    .251E+05      18.1         1.44      23.04
       2.08    404.78    .650E+05      42.3         1.29      25.62
       2.46    405.16    .122E+06      86.3         1.40      23.62
       2.84    405.54    .192E+06     151.6         1.57      21.10
       3.21    405.91    .270E+06     238.3         1.75      18.90
       3.59    406.29    .357E+06     345.8         1.93      17.20
       3.97    406.67    .452E+06     474.9         2.09      15.85
       4.35    407.05    .554E+06     631.1         2.26      14.63
       4.73    407.43    .663E+06     807.8         2.42      13.67
       5.11    407.81    .779E+06    1006.4         2.57      12.89
       5.49    408.19    .902E+06    1229.0         2.71      12.23
       5.86    408.56    .103E+07    1476.4         2.84      11.66
       6.24    408.94    .117E+07    1745.6         2.96      11.18
       6.62    409.32    .132E+07    2034.5         3.07      10.79
       7.00    409.70    .147E+07    2353.2         3.17      10.44

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  2520)  575.36    11.80    2.50  23.73      1.44      1.54
  OUTFLOW: ID= 1 (  4500)  575.36    11.12    2.97  23.73      1.41      1.56
```

```
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   1.734 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  19.830
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.323

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   575.36  11.124     2.97    23.73
     + ID2= 2 (  0610):    78.05   1.734     2.67    19.83
       ==========================================================
       ID = 3 (  2610):   653.41  12.794     2.93    23.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.550 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.180
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
```

```
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79       238.82
                 over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.68 (ii)    2.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.06          0.283 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      60.82        39.18          54.33
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.64           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        78.95
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.02 (ii)    8.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.12          0.377 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      60.82        27.57          40.87
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.45           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.377     1.33    40.87
     + ID2= 2 (  6240):     0.79   0.283     1.33    54.33
       ====================================================
       ID = 3 ( 26240):     2.75   0.660     1.33    44.74

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000  |    0.1390      0.0686
                           0.0060      0.0042  |    0.1510      0.0822
                           0.0130      0.0130  |    0.1630      0.0967
                           0.0200      0.0250  |    0.1730      0.1121
                           0.0250      0.0328  |    0.1780      0.1202
                           0.0290      0.0439  |    2.5750      0.1742
                           0.1260      0.0558  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)     2.750      0.660      1.33      44.74
   OUTFLOW: ID= 1 ( 46240)     2.750      0.137      1.83      44.68

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.75
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0667

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.86
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.02 (ii)    9.47 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.07          0.105 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      60.82        25.49          32.55
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.99         0.42           0.53

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000  |    0.2590      0.0708
                           0.0050      0.0089  |    0.2910      0.0871
                           0.0100      0.0187  |    0.3210      0.1045
                           0.0130      0.0298  |    0.3720      0.1438
                           0.0150      0.0422  |    2.8080      0.2087
```

```
                        0.2220      0.0559   |    0.0000      0.0000

                             AREA     QPEAK     TPEAK       R.V.
                             (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)      0.920      0.105      1.33      32.55
   OUTFLOW: ID= 1 ( 46220)      0.920      0.011      2.83      32.07

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.23
                  TIME SHIFT OF PEAK FLOW         (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0215

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05         0.43
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        40.87
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.68 (ii)    7.34 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.04         0.040 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.50
     RUNOFF VOLUME    (mm)=      60.82        21.40         23.36
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.99         0.35          0.38

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  ( 26200)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.011     2.83    32.07
     + ID2= 2 ( 46240):     2.75   0.137     1.83    44.68
       ================================================
       ID = 3 ( 26200):     3.67   0.147     1.92    41.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  ( 26200)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 ( 26200):     3.67   0.147     1.92    41.51
     + ID2= 2 (  6230):     0.48   0.040     1.50    23.36
       ================================================
       ID = 1 ( 26200):     4.15   0.174     1.58    39.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ROUTE CHN(  0149)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         414.20        0.0350      Main Channel
                  4.30         412.70        0.0350      Main Channel
                  8.60         414.20        0.0350      Main Channel

          <-------------------- TRAVEL TIME TABLE ---------------------->
           DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
            (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
           0.08   412.78    .456E+01       0.0          0.55       7.70
           0.16   412.86    .182E+02       0.1          0.88       4.85
           0.24   412.94    .410E+02       0.2          1.15       3.70
           0.32   413.02    .729E+02       0.4          1.39       3.05
           0.39   413.09    .114E+03       0.7          1.61       2.63
           0.47   413.17    .164E+03       1.2          1.82       2.33
           0.55   413.25    .223E+03       1.8          2.02       2.10
           0.63   413.33    .292E+03       2.5          2.21       1.92
           0.71   413.41    .369E+03       3.5          2.39       1.78
           0.79   413.49    .456E+03       4.6          2.56       1.66
           0.87   413.57    .551E+03       5.9          2.73       1.56
           0.95   413.65    .656E+03       7.4          2.89       1.47
           1.03   413.73    .770E+03       9.2          3.05       1.39
           1.11   413.81    .893E+03      11.2          3.21       1.32
           1.18   413.88    .103E+04      13.5          3.36       1.27
           1.26   413.96    .117E+04      16.0          3.51       1.21
           1.34   414.04    .132E+04      18.9          3.65       1.16
           1.42   414.12    .148E+04      22.0          3.79       1.12
           1.50   414.20    .165E+04      25.4          3.93       1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 26200)    4.15     0.17    1.58  39.42      0.23      1.12
   OUTFLOW: ID= 1 (  0149)    4.15     0.18    1.67  39.41      0.23      1.12


--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD ( 96211)|   Area    (ha)=   0.61
|ID= 1 DT= 5.0 min |   Total Imp(%)=  58.00   Dir. Conn.(%)=  40.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.26
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        66.70
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.67 (ii)    8.65 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.03         0.114 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      60.34        24.96         39.10
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.98         0.41          0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
```

```
          THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55       7.70
       0.16   412.86    .182E+02       0.1          0.88       4.85
       0.24   412.94    .410E+02       0.2          1.15       3.70
       0.32   413.02    .729E+02       0.4          1.39       3.05
       0.39   413.09    .114E+03       0.7          1.61       2.63
       0.47   413.17    .164E+03       1.2          1.82       2.33
       0.55   413.25    .223E+03       1.8          2.02       2.10
       0.63   413.33    .292E+03       2.5          2.21       1.92
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)    (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 96211)    0.61     0.11     1.33  39.10      0.19      0.97
   OUTFLOW: ID= 1 (  0009)    0.61     0.10     1.42  39.07      0.18      0.94



--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0147)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0149):     4.15   0.175     1.67    39.41
     + ID2= 2 (  0627):     9.39   0.550     1.58    19.18
       ================================================
       ID = 3 (  0147):    13.54   0.719     1.58    25.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0147)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0147):    13.54   0.719     1.58    25.38
     + ID2= 2 (  0009):     0.61   0.100     1.42    39.07
       ================================================
       ID = 1 (  0147):    14.15   0.787     1.58    25.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9621)|   Area    (ha)=  16.18
|ID= 1 DT= 5.0 min |   Total Imp(%)=  32.00   Dir. Conn.(%)=  20.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.18        11.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     328.43        30.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        51.46
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       4.46 (ii)   12.21 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.23         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.06         0.94          1.487 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.50
     RUNOFF VOLUME    (mm)=      60.34        23.65         30.98
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.98         0.39          0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8621)|   Area    (ha)=   4.69
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.69         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     176.82        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.01        38.72
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.80 (ii)    3.88 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.25         0.25
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.94         0.00          0.937 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      36.34        21.23         36.34
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.59         0.35          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8623)|   Area    (ha)=   2.05
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
```

```
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.05         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     116.90        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.01        67.28
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.97 (ii)    3.04 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.28         0.28
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.44         0.00          0.440 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      36.34        34.22         36.33
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.59         0.56          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9623)|   Area    (ha)=   4.42
|ID= 1 DT= 5.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  35.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.12         2.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     171.66        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        57.12
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.02 (ii)   10.45 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.27         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.57         0.23          0.643 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      60.34        24.57         37.09
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.98         0.40          0.60

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8624)|   Area    (ha)=   4.32
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.32         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     169.71        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.01        38.72
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.71 (ii)    3.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.25         0.25
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.87         0.00          0.870 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      36.34        21.23         36.34
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.59         0.35          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9624)|   Area    (ha)=   8.46
|ID= 1 DT= 5.0 min |   Total Imp(%)=  51.00   Dir. Conn.(%)=  40.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.31         4.15
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     237.49        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        55.13
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.67 (ii)   11.21 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.25         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.18         0.39          1.307 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      60.34        24.25         38.69
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.98         0.40          0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0628)|   Area    (ha)=   5.35
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.21         2.14
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     188.86        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        77.64
               over (min)        5.00        15.00
```

```
     Storage Coeff.  (min)=       3.20 (ii)   11.01 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.27         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.77         0.28          0.870 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      60.34        27.40          40.57
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.98         0.45           0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8625)|   Area    (ha)=   4.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.11         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     165.53        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.01        67.28
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.65 (ii)    3.73 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.25         0.26
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.83         0.00          0.832 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33           1.42
     RUNOFF VOLUME    (mm)=      36.34        34.22          36.34
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.59         0.56           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9625)|   Area    (ha)=   8.07
|ID= 1 DT= 5.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.44         3.63
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     231.95        30.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.79        63.74
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.62 (ii)   10.73 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.25         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.13         0.40          1.264 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      60.34        25.56          39.47
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.98         0.42           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0628):     5.35   0.870     1.33    40.57
     + ID2= 2 (  8621):     4.69   0.937     1.42    36.34
       ====================================================
       ID = 3 (  2621):    10.04   1.695     1.42    38.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    10.04   1.695     1.42    38.60
     + ID2= 2 (  8623):     2.05   0.440     1.42    36.33
       ====================================================
       ID = 1 (  2621):    12.09   2.135     1.42    38.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    12.09   2.135     1.42    38.21
     + ID2= 2 (  8624):     4.32   0.870     1.42    36.34
       ====================================================
       ID = 3 (  2621):    16.41   3.005     1.42    37.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    16.41   3.005     1.42    37.72
     + ID2= 2 (  8625):     4.11   0.832     1.42    36.34
       ====================================================
       ID = 1 (  2621):    20.52   3.836     1.42    37.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    20.52   3.836     1.42    37.44
     + ID2= 2 (  9621):    16.18   1.487     1.50    30.98
       ====================================================
       ID = 3 (  2621):    36.70   5.302     1.42    34.60
```

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    36.70   5.302     1.42    34.60
     + ID2= 2 (  9623):     4.42   0.643     1.33    37.09
       ================================================
       ID = 1 (  2621):    41.12   5.863     1.42    34.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    41.12   5.863     1.42    34.86
     + ID2= 2 (  9624):     8.46   1.307     1.33    38.69
       ================================================
       ID = 3 (  2621):    49.58   7.025     1.42    35.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    49.58   7.025     1.42    35.52
     + ID2= 2 (  9625):     8.07   1.264     1.33    39.47
       ================================================
       ID = 1 (  2621):    57.65   8.155     1.42    36.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5621)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    1.5000      2.5000
                          0.0010      0.0000   |    2.5000      3.0000
                          0.0100      1.0000   |    3.0000      3.5000
                          0.0500      1.5000   |    4.0000      4.0000
                          0.5000      2.0000   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2621)     57.650      8.155      1.42      36.07
   OUTFLOW: ID= 1 (  5621)     57.650      0.361      3.92      24.08

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.43
                  TIME SHIFT OF PEAK FLOW         (min)=150.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.8461

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  9622)|   Area    (ha)=   6.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  44.00   Dir. Conn.(%)=  30.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.97         3.78
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     212.13        30.00
     Mannings n           =      0.013        0.250
     Max.Eff.Inten.(mm/hr)=     147.79        57.12
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       3.43 (ii)   10.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.72         0.37          0.843 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      60.34        24.57         35.30
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.98         0.40          0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  8622)|   Area    (ha)=   2.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.99   Dir. Conn.(%)=  99.99
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.20         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.01        67.28
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       3.03 (ii)    3.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.27         0.27
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.47         0.00          0.470 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      36.34        34.22         36.34
     TOTAL RAINFALL   (mm)=      61.34        61.34         61.34
     RUNOFF COEFFICIENT   =       0.59         0.56          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8622):     2.20   0.470     1.42    36.34
     + ID2= 2 (  9622):     6.75   0.843     1.33    35.30
       ================================================
       ID = 3 (  2622):     8.95   1.254     1.42    35.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5622)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
```

```
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.4500      0.2500
                          0.0010      0.0000   |    0.6500      0.3200
                          0.0030      0.1200   |    0.8000      0.4000
                          0.1000      0.1500   |    0.9800      0.5000
                          0.3000      0.2000   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2622)     8.950      1.254      1.42      35.56
   OUTFLOW: ID= 1 (  5622)     8.950      0.281      2.08      34.54

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.44
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1954

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  5621):    57.65   0.361     3.92    24.08
     + ID2= 2 (  5622):     8.95   0.281     2.08    34.54
       ================================================
       ID = 3 (  2625):    66.60   0.509     2.83    25.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0150)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0147):    14.15   0.787     1.58    25.97
     + ID2= 2 (  2625):    66.60   0.509     2.83    25.49
       ================================================
       ID = 3 (  0150):    80.75   0.924     1.67    25.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0150):    80.75   0.924     1.67    25.57
     + ID2= 2 (  2610):   653.41  12.794     2.93    23.26
       ================================================
       ID = 3 (  2620):   734.16  13.472     2.90    23.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.42   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.608

     PEAK FLOW       (cms)=   0.493 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.180
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
```

```
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   1.360 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  19.214
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------

               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         414.20        0.0350      Main Channel
                   4.30         412.70        0.0350      Main Channel
                   8.60         414.20        0.0350      Main Channel

     <-------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .893E+01       0.0          0.17       47.72
      0.16   412.86    .357E+02       0.0          0.28       30.06
      0.24   412.94    .804E+02       0.1          0.36       22.94
      0.32   413.02    .143E+03       0.1          0.44       18.94
      0.39   413.09    .223E+03       0.2          0.51       16.32
      0.47   413.17    .322E+03       0.4          0.58       14.45
      0.55   413.25    .438E+03       0.6          0.64       13.04
      0.63   413.33    .572E+03       0.8          0.70       11.93
      0.71   413.41    .724E+03       1.1          0.76       11.03
      0.79   413.49    .893E+03       1.4          0.81       10.28
      0.87   413.57    .108E+04       1.9          0.86        9.65
      0.95   413.65    .129E+04       2.4          0.92        9.10
      1.03   413.73    .151E+04       2.9          0.97        8.63
      1.11   413.81    .175E+04       3.6          1.01        8.22
      1.18   413.88    .201E+04       4.3          1.06        7.85
      1.26   413.96    .229E+04       5.1          1.11        7.52
      1.34   414.04    .258E+04       6.0          1.15        7.22
      1.42   414.12    .289E+04       6.9          1.20        6.95
      1.50   414.20    .323E+04       8.0          1.24        6.70

                                  <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     1.36    1.83  19.21      0.77      0.80
   OUTFLOW: ID= 1 (  4630)   33.04     1.25    2.00  19.21      0.75      0.78

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):   734.16  13.472     2.90    23.02
     + ID2= 2 (  4630):    33.04   1.251     2.00    19.21
       ================================================
       ID = 3 (  2637):   767.20  14.028     2.80    22.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   767.20  14.028     2.80    22.86
     + ID2= 2 (  0637):     8.42   0.493     1.58    19.18
       ================================================
       ID = 1 (  2637):   775.62  14.106     2.80    22.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0636)|   Area    (ha)=   3.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.688

     PEAK FLOW       (cms)=   0.211 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.180
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   775.62  14.106     2.80    22.82
     + ID2= 2 (  0636):     3.60   0.211     1.58    19.18
       ================================================
       ID = 3 (  2636):   779.22  14.140     2.80    22.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   3.940

     PEAK FLOW       (cms)=   1.208 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.180
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0639)|   Area    (ha)=   4.47   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.854

     PEAK FLOW       (cms)=   0.262 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  19.180
     TOTAL RAINFALL   (mm)=  61.344
     RUNOFF COEFFICIENT   =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   779.22  14.140     2.80    22.80
     + ID2= 2 (  0638):    20.63   1.208     1.58    19.18
       ================================================
       ID = 3 (  2630):   799.85  14.330     2.80    22.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   799.85  14.330     2.80    22.71
     + ID2= 2 (  0639):     4.47   0.262     1.58    19.18
       ================================================
       ID = 1 (  2630):   804.32  14.372     2.80    22.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8709)|   Area    (ha)=   3.51
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.51         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      87.01        67.28
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.03 (ii)    1.10 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.84         0.00          0.845 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33           1.42
     RUNOFF VOLUME    (mm)=      36.34        34.22          36.34
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.59         0.56           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9709)|   Area    (ha)=   7.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  40.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.03         3.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     219.09        30.00
     Mannings n           =      0.013        0.250
```

```
     Max.Eff.Inten.(mm/hr)=     147.79        66.21
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.50 (ii)   10.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.02         0.37          1.141 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      60.34        25.91          39.68
     TOTAL RAINFALL   (mm)=      61.34        61.34          61.34
     RUNOFF COEFFICIENT   =       0.98         0.42           0.65

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2709)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  8709):     3.51   0.845     1.42    36.34
      + ID2= 2 (  9709):     7.20   1.141     1.33    39.68
        ================================================
        ID = 3 (  2709):    10.71   1.858     1.42    38.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5709)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.6000      0.3800
                          0.0010      0.0000  |    0.9000      0.5400
                          0.0100      0.1000  |    1.1000      0.7100
                          0.0500      0.2000  |    1.4000      0.8900
                          0.4000      0.2400  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2709)     10.710     1.858      1.42      38.59
   OUTFLOW: ID= 1 (  5709)     10.710     0.413      2.00      38.59

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.22
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2492

--------------------------------------------------------------------------------

 FINISH
================================================================================================
==========
------------------------------------------------------------------------------------------------
----------
  **********************************************
  ** SIMULATION : 25 year Fergus Shand Dam Chic **
  **********************************************

-------------------
| CHICAGO STORM    |    IDF curve parameters: A=3023.000
| Ptotal= 74.68 mm |                          B=  18.000
-------------------                          C=   0.916
                        used in:   INTENSITY =  A / (t + B)^C

                      Duration of storm  =  4.00 hrs
                      Storm time step    =  5.00 min
                      Time to peak ratio =  0.33

 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.00    3.03 |  1.00   25.41 |'  2.00   13.91 |  3.00    4.68
 0.08    3.31 |  1.08   41.74 |'  2.08   12.18 |  3.08    4.41
 0.17    3.65 |  1.17   86.90 |'  2.17   10.79 |  3.17    4.17
 0.25    4.05 |  1.25  170.99 |'  2.25    9.65 |  3.25    3.95
 0.33    4.54 |  1.33  106.07 |'  2.33    8.70 |  3.33    3.75
 0.42    5.15 |  1.42   67.82 |'  2.42    7.91 |  3.42    3.56
 0.50    5.92 |  1.50   47.76 |'  2.50    7.23 |  3.50    3.40
 0.58    6.93 |  1.58   35.82 |'  2.58    6.65 |  3.58    3.24
 0.67    8.29 |  1.67   28.10 |'  2.67    6.15 |  3.67    3.10
 0.75   10.20 |  1.75   22.79 |'  2.75    5.71 |  3.75    2.97
 0.83   13.02 |  1.83   18.97 |'  2.83    5.33 |  3.83    2.85
 0.92   17.51 |  1.92   16.11 |'  2.92    4.99 |  3.92    2.74

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Unit Hyd Qpeak  (cms)=   4.464

    PEAK FLOW       (cms)=   3.657 (i)
    TIME TO PEAK    (hrs)=   2.867
    RUNOFF VOLUME    (mm)=  26.414
    TOTAL RAINFALL   (mm)=  74.676
    RUNOFF COEFFICIENT   =   0.354

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
    Unit Hyd Qpeak  (cms)=   0.575

    PEAK FLOW       (cms)=   0.567 (i)
    TIME TO PEAK    (hrs)=   2.600
    RUNOFF VOLUME    (mm)=  32.968
    TOTAL RAINFALL   (mm)=  74.676
    RUNOFF COEFFICIENT   =   0.441

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       3.69         4.51
    Dep. Storage     (mm)=       2.00         5.00
    Average Slope     (%)=       1.20         1.20
    Length            (m)=      25.00        25.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
```

```
     Max.Eff.Inten.(mm/hr)=     156.97        83.70
               over (min)         5.00         8.00
     Storage Coeff.  (min)=       0.88 (ii)    7.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.95         0.78          1.387 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.37
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.567     2.60    32.97
     + ID2= 2 (  0203):     8.20   1.387     1.37    43.88
       ================================================
       ID = 3 (  2200):    22.80   1.414     1.37    36.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000  |    0.1980      0.2314
                          0.0040      0.0218  |    0.2920      0.2621
                          0.0060      0.0446  |    0.3980      0.2937
                          0.0070      0.0683  |    0.5150      0.3261
                          0.0080      0.0930  |    0.8290      0.3592
                          0.0090      0.1187  |    1.3520      0.3930
                          0.0230      0.1453  |    2.0570      0.4275
                          0.0610      0.1730  |    2.9590      0.4629
                          0.1200      0.2017  |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800      1.414      1.37      36.89
   OUTFLOW: ID= 1 (  5200)     22.800      0.650      2.87      36.46

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 45.99
                  TIME SHIFT OF PEAK FLOW         (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3404

     **** WARNING : SELECTED ROUTING TIME STEP DENIED.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.568 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  52.808
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.707

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     156.97        83.70
               over (min)         5.00         8.00
     Storage Coeff.  (min)=       0.88 (ii)    7.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.034 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.37
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.86
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.568     1.83    52.81
     + ID2= 2 (  0206):     0.20   0.034     1.37    43.86
       ================================================
       ID = 3 (  2201):     5.00   0.581     1.83    52.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.581     1.83    52.45
     + ID2= 2 (  5200):    22.80   0.650     2.87    36.46
       ================================================
       ID = 1 (  2201):    27.80   0.889     2.03    39.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
```

```
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     156.97        57.41
               over (min)        5.00        12.00
     Storage Coeff.  (min)=       1.08 (ii)   10.56 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=       0.50         0.10
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.24          0.273 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.57           1.53
     RUNOFF VOLUME    (mm)=      72.68        29.82          33.25
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.40           0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     156.97        83.70
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       0.88 (ii)    7.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.12          0.220 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.37
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.220     1.37    43.88
     + ID2= 2 (  0209):     2.70   0.273     1.53    33.25
       ================================================
       ID = 3 (  2202):     4.00   0.455     1.50    36.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.455     1.50    36.70
     + ID2= 2 (  2201):    27.80   0.889     2.03    39.33
       ================================================
       ID = 1 (  2202):    31.80   1.095     1.87    39.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98   3.657     2.87    26.41
     + ID2= 2 (  2202):    31.80   1.095     1.87    39.00
       ================================================
       ID = 3 (  2100):   168.78   4.530     2.80    28.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.192 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  32.968
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.441

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     156.97        83.70
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    8.43 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.13
```

```
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.51         0.41          0.690 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.37
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.88
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.192     1.93    32.97
     + ID2= 2 (  0304):     4.40   0.690     1.37    43.88
       ================================================
       ID = 3 (  2300):     7.30   0.722     1.37    39.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     156.97        83.70
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    8.43 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.52         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.031 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.37
     RUNOFF VOLUME    (mm)=      72.68        34.28          43.85
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.46           0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     156.97        57.41
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.88 (ii)    8.63 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.53         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.55          0.630 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53           1.50
     RUNOFF VOLUME    (mm)=      72.68        29.82          33.25
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.40           0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.722     1.37    39.54
     + ID2= 2 (  0308):     0.20   0.031     1.37    43.85
       ================================================
       ID = 3 (  2301):     7.50   0.753     1.37    39.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.753     1.37    39.66
     + ID2= 2 (  0310):     5.70   0.630     1.50    33.25
       ================================================
       ID = 1 (  2301):    13.20   1.371     1.47    36.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   4.530     2.80    28.79
     + ID2= 2 (  2301):    13.20   1.371     1.47    36.89
       ================================================
       ID = 3 (  2302):   181.98   4.761     2.73    29.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 2.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     122.41        54.03
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      12.98 (ii)   22.00 (ii)
     Unit Hyd. Tpeak (min)=      12.00        24.00
     Unit Hyd. peak  (cms)=       0.09         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.60         5.15          5.539 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.80           1.80
     RUNOFF VOLUME    (mm)=      72.67        28.68          30.00
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.97         0.38           0.40

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
             THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   4.761     2.73    29.37
     + ID2= 2 (  0400):    82.86   5.539     1.80    30.00
       ================================================
       ID = 3 (  2400):   264.84   8.866     1.87    29.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  0.00         411.10        0.0550
                 27.30         410.20        0.0550
                 77.50         409.10        0.0550
                 96.60         409.10        0.0550
                115.80         408.90        0.0550
                124.80         409.10        0.0550
                131.00         408.90    0.0550 /0.0350  Main Channel
                133.60         408.00        0.0350      Main Channel
                134.40         407.60        0.0350      Main Channel
                135.00         407.50        0.0350      Main Channel
                135.80         407.60        0.0350      Main Channel
                136.50         408.00        0.0350      Main Channel
                139.40         408.80    0.0350 /0.0550  Main Channel
                143.50         408.90        0.0550
                148.50         408.70        0.0550
                163.80         408.90        0.0550
                183.20         408.90        0.0550
                243.70         409.70        0.0550
                278.70         410.20        0.0550
                330.50         411.40        0.0550

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.19   407.69    .366E+03        0.1         0.51      58.83
       0.37   407.87    .106E+04        0.5         0.81      37.08
       0.56   408.06    .199E+04        1.1         1.00      29.93
       0.74   408.24    .328E+04        2.1         1.14      26.32
       0.93   408.43    .498E+04        3.6         1.28      23.32
       1.11   408.61    .708E+04        5.6         1.43      20.94
       1.30   408.80    .105E+05        8.5         1.45      20.61
       1.49   408.99    .247E+05       14.8         1.07      27.91
       1.68   409.18    .601E+05       30.4         0.91      32.97
       1.87   409.37    .109E+06       58.5         0.96      31.05
       2.06   409.56    .166E+06       98.3         1.06      28.11
       2.25   409.75    .231E+06      150.3         1.17      25.57
       2.44   409.94    .303E+06      215.4         1.28      23.46
       2.64   410.14    .383E+06      293.8         1.38      21.74
       2.83   410.33    .470E+06      390.1         1.49      20.10
       3.02   410.52    .563E+06      502.4         1.60      18.66
       3.21   410.71    .660E+06      628.8         1.71      17.48
       3.40   410.90    .762E+06      769.5         1.81      16.49
       3.59   411.09    .868E+06      924.9         1.91      15.65

                                        <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  2400)  264.84     8.87    1.87  29.57      1.31      1.42
   OUTFLOW: ID= 1 (  4400)  264.84     7.67    2.33  29.57      1.25      1.45

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.265 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  25.502
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.342

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.09

     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   2.973 (i)
     TIME TO PEAK    (hrs)=   2.750
     RUNOFF VOLUME    (mm)=  30.266
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.405

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  0.00         414.20        0.0350      Main Channel
```

```
                4.30        412.70        0.0350      Main Channel
                8.60        414.20        0.0350      Main Channel

      <-------------------- TRAVEL TIME TABLE --------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .206E+02       0.0          0.19      101.61
        0.16   412.86    .822E+02       0.0          0.30       64.01
        0.24   412.94    .185E+03       0.1          0.39       48.85
        0.32   413.02    .329E+03       0.1          0.48       40.33
        0.39   413.09    .514E+03       0.2          0.55       34.75
        0.47   413.17    .740E+03       0.4          0.62       30.77
        0.55   413.25    .101E+04       0.6          0.69       27.77
        0.63   413.33    .132E+04       0.9          0.75       25.40
        0.71   413.41    .166E+04       1.2          0.82       23.48
        0.79   413.49    .206E+04       1.6          0.88       21.89
        0.87   413.57    .249E+04       2.0          0.93       20.54
        0.95   413.65    .296E+04       2.5          0.99       19.39
        1.03   413.73    .347E+04       3.1          1.04       18.38
        1.11   413.81    .403E+04       3.8          1.10       17.49
        1.18   413.88    .462E+04       4.6          1.15       16.71
        1.26   413.96    .526E+04       5.5          1.20       16.00
        1.34   414.04    .594E+04       6.4          1.25       15.37
        1.42   414.12    .666E+04       7.5          1.30       14.79
        1.50   414.20    .742E+04       8.7          1.34       14.27

                                  <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0510)   91.44     2.97    2.75  30.27      1.00      1.03
   OUTFLOW: ID= 1 (  4510)   91.44     2.84    3.00  30.26      0.98      1.01



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.158 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  30.256
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.405

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43        26.43
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     593.69        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        95.30
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       6.00 (ii)   14.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.19         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       5.47         3.91        7.494 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.42
     RUNOFF VOLUME    (mm)=      73.88        36.68         47.84
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.99         0.49          0.64


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        47.89
               over (min)        5.00        20.00
     Storage Coeff.  (min)=       3.72 (ii)   15.39 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.25         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.96         0.49          2.076 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      73.88        30.27          49.89
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.41           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   7.494     1.42    47.84
     + ID2= 2 (  0516):    10.78   2.076     1.33    49.89
       ==========================================================
       ID = 3 (  2511):    63.65   9.282     1.42    48.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                           0.7700      0.9000   |    3.2130      1.6220
                           1.6000      1.1400   |    3.9540      1.8810
                           2.2900      1.2810   |    4.9000      2.3000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650      9.282      1.42      48.18
```

```
   OUTFLOW: ID= 1 (  4511)     63.650      3.199      2.08      48.18

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 34.46
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.6168

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   2.836     3.00    30.26
     + ID2= 2 (  4511):    63.65   3.199     2.08    48.18
       ================================================
       ID = 3 (  2510):   155.09   5.325     2.67    37.61

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   5.325     2.67    37.61
     + ID2= 2 (  0517):     2.14   0.158     1.75    30.26
       ================================================
       ID = 1 (  2510):   157.23   5.372     2.58    37.51

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      13.56        13.56
    Dep. Storage     (mm)=       0.80         1.50
    Average Slope     (%)=       1.00         2.00
    Length            (m)=     425.28        40.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     170.99        95.30
              over (min)        5.00        15.00
    Storage Coeff.  (min)=       4.91 (ii)   12.11 (ii)
    Unit Hyd. Tpeak (min)=       5.00        15.00
    Unit Hyd. peak  (cms)=       0.22         0.09
                                                    *TOTALS*
    PEAK FLOW       (cms)=       3.02         2.18          4.053 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.58           1.42
    RUNOFF VOLUME    (mm)=      73.88        36.68          47.84
    TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
    RUNOFF COEFFICIENT   =       0.99         0.49           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       4.19         2.25
    Dep. Storage     (mm)=       0.80         1.50
    Average Slope     (%)=       1.00         1.00
    Length            (m)=     207.20        40.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     170.99       148.20
              over (min)        5.00        15.00
    Storage Coeff.  (min)=       3.19 (ii)   10.62 (ii)
    Unit Hyd. Tpeak (min)=       5.00        15.00
    Unit Hyd. peak  (cms)=       0.27         0.09
                                                    *TOTALS*
    PEAK FLOW       (cms)=       0.95         0.59          1.170 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.58           1.33
    RUNOFF VOLUME    (mm)=      73.88        42.06          53.19
    TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
    RUNOFF COEFFICIENT   =       0.99         0.56           0.71

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
-------------------         (ha)     (cms)     (hrs)    (mm)
    TOTAL HYD.(ID= 1):   6.44      1.17      1.33   53.19
    ================================================
    MAJOR SYS.(ID= 2):   0.79      0.44      1.33   53.19
    MINOR SYS.(ID= 3):   5.65      0.73      1.33   53.19

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   4.053     1.42    47.84
     + ID2= 2 (  8512):     5.65   0.732     1.33    53.19
       ================================================
       ID = 3 (  2512):    32.78   4.785     1.42    48.76

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.6640      0.9151
                          0.0210      0.1601   |    0.8570      1.0220
                          0.0360      0.3317   |    1.0660      1.1320
                          0.0410      0.4218   |    1.2900      1.2450
                          0.1000      0.5147   |    1.5290      1.3610
                          0.2030      0.6105   |    1.7810      1.4800
                          0.3340      0.7092   |    2.0460      1.6020
                          0.4890      0.8107   |    2.3220      1.7260

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     32.777      4.785      1.42      48.76
   OUTFLOW: ID= 1 (  5512)     32.777      0.972      2.42      48.70
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.31
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 1.0834

ADD HYD (2514)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2510):		157.23	5.372	2.58	37.51
+ ID2= 2 (0515):		5.01	0.265	1.83	25.50
ID = 3 (2514):		162.24	5.504	2.58	37.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2514)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2514):		162.24	5.504	2.58	37.14
+ ID2= 2 (5512):		32.78	0.972	2.42	48.70
ID = 1 (2514):		195.02	6.459	2.58	39.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0518)| ID= 1 DT= 5.0 min	Area (ha)= 6.68	Curve Number (CN)= 71.0	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	U.H. Tp(hrs)= 0.20

Unit Hyd Qpeak (cms)= 1.276

PEAK FLOW (cms)= 0.579 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 27.940
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.374

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2513)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2514):		195.02	6.459	2.58	39.09
+ ID2= 2 (4400):		264.84	7.668	2.33	29.57
ID = 3 (2513):		459.86	14.052	2.43	33.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2513)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2513):		459.86	14.052	2.43	33.53
+ ID2= 2 (0518):		6.68	0.579	1.58	27.94
ID = 1 (2513):		466.54	14.190	2.40	33.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0520)| ID= 1 DT= 2.0 min	Area (ha)= 108.36	Curve Number (CN)= 71.0	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	U.H. Tp(hrs)= 1.20

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

Unit Hyd Qpeak (cms)= 3.449

PEAK FLOW (cms)= 3.017 (i)
TIME TO PEAK (hrs)= 2.900
RUNOFF VOLUME (mm)= 27.994
TOTAL RAINFALL (mm)= 74.676
RUNOFF COEFFICIENT = 0.375

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2520)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2513):		466.54	14.190	2.40	33.45
+ ID2= 2 (0520):		108.36	3.017	2.90	27.99
ID = 3 (2520):		574.90	16.922	2.53	32.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(4500)| IN= 2---> OUT= 1	Routing time step (min)'= 2.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	409.70	0.0550	
19.70	408.80	0.0550	
41.70	407.20	0.0550	
60.50	405.30	0.0550	
80.00	404.50	0.0550	
95.70	404.60	0.0550 /0.0350	Main Channel
98.60	403.40	0.0350	Main Channel
100.40	403.40	0.0350	Main Channel
100.80	402.90	0.0350	Main Channel
101.50	402.70	0.0350	Main Channel
102.30	402.80	0.0350	Main Channel
103.30	403.20	0.0350	Main Channel
104.00	403.20	0.0350	Main Channel
105.60	404.40	0.0350 /0.0550	Main Channel
109.70	404.30	0.0550	
128.60	404.20	0.0550	
154.10	405.40	0.0550	
179.10	406.70	0.0550	
201.90	408.60	0.0550	
224.20	410.60	0.0550	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.34	403.04	.954E+03	0.3	0.70	47.40
0.68	403.38	.304E+04	1.6	1.03	32.27
1.02	403.72	.718E+04	4.5	1.25	26.57
1.36	404.06	.122E+05	9.7	1.58	20.96
1.70	404.40	.251E+05	18.1	1.44	23.04
2.08	404.78	.650E+05	42.3	1.29	25.62
2.46	405.16	.122E+06	86.3	1.40	23.62
2.84	405.54	.192E+06	151.6	1.57	21.10
3.21	405.91	.270E+06	238.3	1.75	18.90
3.59	406.29	.357E+06	345.8	1.93	17.20
3.97	406.67	.452E+06	474.9	2.09	15.85

```
       4.35   407.05    .554E+06     631.1          2.26      14.63
       4.73   407.43    .663E+06     807.8          2.42      13.67
       5.11   407.81    .779E+06    1006.4          2.57      12.89
       5.49   408.19    .902E+06    1229.0          2.71      12.23
       5.86   408.56    .103E+07    1476.4          2.84      11.66
       6.24   408.94    .117E+07    1745.6          2.96      11.18
       6.62   409.32    .132E+07    2034.5          3.07      10.79
       7.00   409.70    .147E+07    2353.2          3.17      10.44

                                 <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  2520)  574.90    16.92    2.53  32.42      1.65      1.46
  OUTFLOW: ID= 1 (  4500)  574.90    15.82    3.03  32.42      1.61      1.47



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   2.491 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  27.994
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.375

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   574.90  15.824     3.03    32.42
     + ID2= 2 (  0610):    78.05   2.491     2.67    27.99
       ================================================
       ID = 3 (  2610):   652.95  18.198     2.93    31.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.788 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.140
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
--------------------
```

```
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99       305.25
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.64 (ii)    2.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.30
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.07         0.335 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      74.16        51.21         67.27
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.99         0.69          0.90

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99       107.08
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.97 (ii)    7.83 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.37         0.17         0.459 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      74.16        37.76         52.32
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.99         0.51          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.459     1.33    52.32
     + ID2= 2 (  6240):     0.79   0.335     1.33    67.27
       ================================================
       ID = 3 ( 26240):     2.75   0.794     1.33    56.61
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(46240) IN= 2---> OUT= 1 DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1390	0.0686
	0.0060	0.0042	0.1510	0.0822
	0.0130	0.0130	0.1630	0.0967
	0.0200	0.0250	0.1730	0.1121
	0.0250	0.0328	0.1780	0.1202
	0.0290	0.0439	2.5750	0.1742
	0.1260	0.0558	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (26240)	2.750	0.794	1.33	56.61
OUTFLOW: ID= 1 (46240)	2.750	0.155	1.92	56.55

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.45
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.0865

CALIB STANDHYD (6220) ID= 1 DT= 5.0 min	Area (ha)= 0.92 Total Imp(%)= 40.00 Dir. Conn.(%)= 20.00		
		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.37	0.55
Dep. Storage	(mm)=	0.52	7.16
Average Slope	(%)=	2.00	2.00
Length	(m)=	40.00	40.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	170.99	87.70
over (min)		5.00	10.00
Storage Coeff. (min)=		0.97 (ii)	8.40 (ii)
Unit Hyd. Tpeak (min)=		5.00	10.00
Unit Hyd. peak (cms)=		0.34	0.12

		TOTALS
PEAK FLOW	(cms)=	0.09 0.10 0.142 (iii)
TIME TO PEAK	(hrs)=	1.33 1.50 1.42
RUNOFF VOLUME	(mm)=	74.16 35.26 43.03
TOTAL RAINFALL	(mm)=	74.68 74.68 74.68
RUNOFF COEFFICIENT	=	0.99 0.47 0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(46220) IN= 2---> OUT= 1 DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.2590	0.0708
	0.0050	0.0089	0.2910	0.0871
	0.0100	0.0187	0.3210	0.1045
	0.0130	0.0298	0.3720	0.1438
	0.0150	0.0422	2.8080	0.2087
	0.2220	0.0559	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (6220)	0.920	0.142	1.42	43.03
OUTFLOW: ID= 1 (46220)	0.920	0.013	2.83	42.55

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.06
TIME SHIFT OF PEAK FLOW (min)= 85.00
MAXIMUM STORAGE USED (ha.m.)= 0.0294

CALIB STANDHYD (6230) ID= 1 DT= 5.0 min	Area (ha)= 0.48 Total Imp(%)= 10.00 Dir. Conn.(%)= 5.00		
		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.05	0.43
Dep. Storage	(mm)=	0.52	7.16
Average Slope	(%)=	2.00	2.00
Length	(m)=	20.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	170.99	57.71
over (min)		5.00	10.00
Storage Coeff. (min)=		0.64 (ii)	6.44 (ii)
Unit Hyd. Tpeak (min)=		5.00	10.00
Unit Hyd. peak (cms)=		0.34	0.14

		TOTALS
PEAK FLOW	(cms)=	0.01 0.05 0.058 (iii)
TIME TO PEAK	(hrs)=	1.33 1.50 1.50
RUNOFF VOLUME	(mm)=	74.16 30.24 32.42
TOTAL RAINFALL	(mm)=	74.68 74.68 74.68
RUNOFF COEFFICIENT	=	0.99 0.40 0.43

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (26200) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (46220):	0.92	0.013	2.83	42.55
+ ID2= 2 (46240):	2.75	0.155	1.92	56.55
ID = 3 (26200):	3.67	0.166	1.92	53.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (26200) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (26200):	3.67	0.166	1.92	53.04
+ ID2= 2 (6230):	0.48	0.058	1.50	32.42
ID = 1 (26200):	4.15	0.205	1.58	50.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ROUTE CHN(  0149)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .456E+01       0.0          0.55       7.70
      0.16   412.86    .182E+02       0.1          0.88       4.85
      0.24   412.94    .410E+02       0.2          1.15       3.70
      0.32   413.02    .729E+02       0.4          1.39       3.05
      0.39   413.09    .114E+03       0.7          1.61       2.63
      0.47   413.17    .164E+03       1.2          1.82       2.33
      0.55   413.25    .223E+03       1.8          2.02       2.10
      0.63   413.33    .292E+03       2.5          2.21       1.92
      0.71   413.41    .369E+03       3.5          2.39       1.78
      0.79   413.49    .456E+03       4.6          2.56       1.66
      0.87   413.57    .551E+03       5.9          2.73       1.56
      0.95   413.65    .656E+03       7.4          2.89       1.47
      1.03   413.73    .770E+03       9.2          3.05       1.39
      1.11   413.81    .893E+03      11.2          3.21       1.32
      1.18   413.88    .103E+04      13.5          3.36       1.27
      1.26   413.96    .117E+04      16.0          3.51       1.21
      1.34   414.04    .132E+04      18.9          3.65       1.16
      1.42   414.12    .148E+04      22.0          3.79       1.12
      1.50   414.20    .165E+04      25.4          3.93       1.08

                                <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 26200)    4.15     0.21    1.58  50.66      0.24      1.17
   OUTFLOW: ID= 1 (  0149)    4.15     0.21    1.58  50.65      0.25      1.17



--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD ( 96211)|   Area    (ha)=   0.61
|ID= 1 DT= 5.0 min |   Total Imp(%)=  58.00   Dir. Conn.(%)=  40.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.26
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        90.78
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.57 (ii)    6.46 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.05         0.140 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      73.68        34.37         50.09
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.99         0.46          0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.

      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .456E+01       0.0          0.55       7.70
      0.16   412.86    .182E+02       0.1          0.88       4.85
      0.24   412.94    .410E+02       0.2          1.15       3.70
      0.32   413.02    .729E+02       0.4          1.39       3.05
      0.39   413.09    .114E+03       0.7          1.61       2.63
      0.47   413.17    .164E+03       1.2          1.82       2.33
      0.55   413.25    .223E+03       1.8          2.02       2.10
      0.63   413.33    .292E+03       2.5          2.21       1.92
      0.71   413.41    .369E+03       3.5          2.39       1.78
      0.79   413.49    .456E+03       4.6          2.56       1.66
      0.87   413.57    .551E+03       5.9          2.73       1.56
      0.95   413.65    .656E+03       7.4          2.89       1.47
      1.03   413.73    .770E+03       9.2          3.05       1.39
      1.11   413.81    .893E+03      11.2          3.21       1.32
      1.18   413.88    .103E+04      13.5          3.36       1.27
      1.26   413.96    .117E+04      16.0          3.51       1.21
      1.34   414.04    .132E+04      18.9          3.65       1.16
      1.42   414.12    .148E+04      22.0          3.79       1.12
      1.50   414.20    .165E+04      25.4          3.93       1.08

                                <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 96211)    0.61     0.14    1.33  50.09      0.21      1.03
   OUTFLOW: ID= 1 (  0009)    0.61     0.13    1.42  50.04      0.20      1.00



--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0147)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0149):     4.15    0.209     1.58    50.65
     + ID2= 2 (  0627):     9.39    0.788     1.58    27.14
       ================================================
       ID = 3 (  0147):    13.54    0.998     1.58    34.35

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0147)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0147):    13.54    0.998     1.58    34.35
     + ID2= 2 (  0009):     0.61    0.128     1.42    50.04
       ================================================
       ID = 1 (  0147):    14.15    1.088     1.58    35.02

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
```

```
| STANDHYD (  9621)|   Area    (ha)=  16.18
|ID= 1 DT= 5.0 min |   Total Imp(%)=  32.00   Dir. Conn.(%)=  20.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.18        11.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     328.43        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        69.57
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       4.21 (ii)   11.07 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.24         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.26         1.34          2.008 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.50
     RUNOFF VOLUME    (mm)=      73.68        32.47          40.71
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.43           0.55

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8621)|   Area    (ha)=   4.69
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.69         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     176.82        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     110.63        52.82
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.45 (ii)    3.52 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.26         0.26
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.32         0.00          1.316 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33           1.42
     RUNOFF VOLUME    (mm)=      49.68        29.42          49.67
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.67         0.39           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8623)|   Area    (ha)=   2.05
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.05         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     116.90        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     110.63        87.62
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.69 (ii)    2.76 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.29
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.59         0.00          0.593 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33           1.42
     RUNOFF VOLUME    (mm)=      49.68        45.38          49.67
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.67         0.61           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9623)|   Area    (ha)=   4.42
|ID= 1 DT= 5.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  35.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.12         2.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     171.66        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        76.95
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.85 (ii)    9.45 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.28         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.67         0.34          0.842 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      73.68        33.62          47.64
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.45           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8624)|   Area    (ha)=   4.32
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.32         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     169.71        40.00
```

```
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     110.63        52.82
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.37 (ii)    3.44 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.26         0.26
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.22         0.00          1.217 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      49.68        29.42         49.67
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.67         0.39          0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9624)|   Area    (ha)=   8.46
|ID= 1 DT= 5.0 min |   Total Imp(%)=  51.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.31         4.15
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     237.49        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        74.37
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.46 (ii)   10.15 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.10
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.39         0.56          1.590 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.33
     RUNOFF VOLUME    (mm)=      73.68        33.23         49.41
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.99         0.44          0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0628)|   Area    (ha)=   5.35
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.21         2.14
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     188.86        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99       103.50
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.02 (ii)    9.98 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.91         0.41          1.130 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      73.68        37.12         51.74
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.99         0.50          0.69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8625)|   Area    (ha)=   4.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.11         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     165.53        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     110.63        87.62
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.32 (ii)    3.39 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.26         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.16         0.00          1.160 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33          1.42
     RUNOFF VOLUME    (mm)=      49.68        45.38         49.67
     TOTAL RAINFALL   (mm)=      74.68        74.68         74.68
     RUNOFF COEFFICIENT   =       0.67         0.61          0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9625)|   Area    (ha)=   8.07
|ID= 1 DT= 5.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.44         3.63
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     231.95        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        85.56
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.42 (ii)    9.74 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.26         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.34         0.59          1.642 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
```

```
     RUNOFF VOLUME    (mm)=      73.68        34.86          50.38
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.47           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0628):     5.35   1.130     1.33    51.74
     + ID2= 2 (  8621):     4.69   1.316     1.42    49.67
       ================================================
       ID = 3 (  2621):    10.04   2.381     1.42    50.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    10.04   2.381     1.42    50.77
     + ID2= 2 (  8623):     2.05   0.593     1.42    49.67
       ================================================
       ID = 1 (  2621):    12.09   2.973     1.42    50.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    12.09   2.973     1.42    50.59
     + ID2= 2 (  8624):     4.32   1.217     1.42    49.67
       ================================================
       ID = 3 (  2621):    16.41   4.190     1.42    50.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    16.41   4.190     1.42    50.35
     + ID2= 2 (  8625):     4.11   1.160     1.42    49.67
       ================================================
       ID = 1 (  2621):    20.52   5.351     1.42    50.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    20.52   5.351     1.42    50.21
     + ID2= 2 (  9621):    16.18   2.008     1.50    40.71
       ================================================
       ID = 3 (  2621):    36.70   7.270     1.42    46.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    36.70   7.270     1.42    46.02
     + ID2= 2 (  9623):     4.42   0.842     1.33    47.64
       ================================================
       ID = 1 (  2621):    41.12   8.073     1.42    46.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    41.12   8.073     1.42    46.20
     + ID2= 2 (  9624):     8.46   1.590     1.33    49.41
       ================================================
       ID = 3 (  2621):    49.58   9.532     1.42    46.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    49.58   9.532     1.42    46.74
     + ID2= 2 (  9625):     8.07   1.642     1.33    50.38
       ================================================
       ID = 1 (  2621):    57.65  11.110     1.42    47.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5621)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    1.5000      2.5000
                          0.0010      0.0000   |    2.5000      3.0000
                          0.0100      1.0000   |    3.0000      3.5000
                          0.0500      1.5000   |    4.0000      4.0000
                          0.5000      2.0000   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2621)     57.650     11.110      1.42      47.25
   OUTFLOW: ID= 1 (  5621)     57.650      0.888      2.83      35.20

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.99
                  TIME SHIFT OF PEAK FLOW         (min)= 85.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  2.1941

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  9622)|   Area    (ha)=   6.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  44.00   Dir. Conn.(%)=  30.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        2.97          3.78
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        1.00          2.00
     Length            (m)=      212.13         30.00
     Mannings n           =       0.013         0.250
```

```
     Max.Eff.Inten.(mm/hr)=     170.99        76.95
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       3.24 (ii)    9.83 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.85         0.55          1.150 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      73.68        33.62          45.64
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.45           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  8622)|   Area    (ha)=   2.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.99   Dir. Conn.(%)=  99.99
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.20         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     110.63        87.62
               over (min)          5.00         5.00
     Storage Coeff.  (min)=       2.75 (ii)    2.92 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.28         0.28
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.63         0.00          0.635 (iii)
     TIME TO PEAK    (hrs)=       1.42         1.33           1.42
     RUNOFF VOLUME    (mm)=      49.68        45.38          49.67
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.67         0.61           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8622):     2.20   0.635     1.42    49.67
     + ID2= 2 (  9622):     6.75   1.150     1.42    45.64
       ================================================
       ID = 3 (  2622):     8.95   1.784     1.42    46.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5622)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.4500      0.2500
                           0.0010      0.0000   |    0.6500      0.3200
                           0.0030      0.1200   |    0.8000      0.4000
                           0.1000      0.1500   |    0.9800      0.5000
                           0.3000      0.2000   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2622)      8.950     1.784      1.42      46.63
   OUTFLOW: ID= 1 (  5622)      8.950     0.426      2.00      45.61

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.89
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2423

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  5621):    57.65   0.888     2.83    35.20
     + ID2= 2 (  5622):     8.95   0.426     2.00    45.61
       ================================================
       ID = 3 (  2625):    66.60   1.212     2.58    36.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0150)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0147):    14.15   1.088     1.58    35.02
     + ID2= 2 (  2625):    66.60   1.212     2.58    36.60
       ================================================
       ID = 3 (  0150):    80.75   1.574     2.33    36.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0150):    80.75   1.574     2.33    36.32
     + ID2= 2 (  2610):   652.95  18.198     2.93    31.89
       ================================================
       ID = 3 (  2620):   733.70  19.617     2.93    31.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD   (  0637)|   Area    (ha)=   8.42   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.608

     PEAK FLOW       (cms)=   0.707 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.140
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
```

```
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   1.963 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  27.188
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.364

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation      Manning
                  0.00        414.20       0.0350      Main Channel
                  4.30        412.70       0.0350      Main Channel
                  8.60        414.20       0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17      47.72
       0.16   412.86    .357E+02       0.0          0.28      30.06
       0.24   412.94    .804E+02       0.1          0.36      22.94
       0.32   413.02    .143E+03       0.1          0.44      18.94
       0.39   413.09    .223E+03       0.2          0.51      16.32
       0.47   413.17    .322E+03       0.4          0.58      14.45
       0.55   413.25    .438E+03       0.6          0.64      13.04
       0.63   413.33    .572E+03       0.8          0.70      11.93
       0.71   413.41    .724E+03       1.1          0.76      11.03
       0.79   413.49    .893E+03       1.4          0.81      10.28
       0.87   413.57    .108E+04       1.9          0.86       9.65
       0.95   413.65    .129E+04       2.4          0.92       9.10
       1.03   413.73    .151E+04       2.9          0.97       8.63
       1.11   413.81    .175E+04       3.6          1.01       8.22
       1.18   413.88    .201E+04       4.3          1.06       7.85
       1.26   413.96    .229E+04       5.1          1.11       7.52
       1.34   414.04    .258E+04       6.0          1.15       7.22
       1.42   414.12    .289E+04       6.9          1.20       6.95
       1.50   414.20    .323E+04       8.0          1.24       6.70

                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     1.96    1.83  27.19      0.88      0.87
   OUTFLOW: ID= 1 (  4630)   33.04     1.83    2.00  27.18      0.86      0.86


--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):   733.70  19.617     2.93    31.88
     + ID2= 2 (  4630):    33.04   1.829     2.00    27.18
       ================================================
       ID = 3 (  2637):   766.74  20.334     2.83    31.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
```

```
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   766.74  20.334     2.83    31.68
     + ID2= 2 (  0637):     8.42   0.707     1.58    27.14
       ================================================
       ID = 1 (  2637):   775.16  20.436     2.83    31.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.688

     PEAK FLOW       (cms)=   0.302 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.140
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   775.16  20.436     2.83    31.63
     + ID2= 2 (  0636):     3.60   0.302     1.58    27.14
       ================================================
       ID = 3 (  2636):   778.76  20.479     2.83    31.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   3.940

     PEAK FLOW       (cms)=   1.732 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.140
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.47   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.854

     PEAK FLOW       (cms)=   0.375 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  27.140
     TOTAL RAINFALL   (mm)=  74.676
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   778.76  20.479     2.83    31.61
     + ID2= 2 (  0638):    20.63   1.732     1.58    27.14
       ==================================================
       ID = 3 (  2630):   799.39  20.728     2.80    31.49

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   799.39  20.728     2.80    31.49
     + ID2= 2 (  0639):     4.47   0.375     1.58    27.14
       ==================================================
       ID = 1 (  2630):   803.86  20.784     2.80    31.47

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8709)|   Area    (ha)=   3.51
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.51         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     110.63        87.62
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.93 (ii)    1.00 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.07         0.00          1.074 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      49.68        45.38          49.68
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.67         0.61           0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9709)|   Area    (ha)=   7.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  40.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.03         3.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     219.09        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     170.99        88.75
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.30 (ii)    8.28 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.20         0.56          1.505 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      73.68        35.29          50.64
     TOTAL RAINFALL   (mm)=      74.68        74.68          74.68
     RUNOFF COEFFICIENT   =       0.99         0.47           0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2709)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8709):     3.51   1.074     1.33    49.68
     + ID2= 2 (  9709):     7.20   1.505     1.33    50.64
       ==================================================
       ID = 3 (  2709):    10.71   2.579     1.33    50.33

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5709)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.6000      0.3800
                           0.0010      0.0000   |    0.9000      0.5400
                           0.0100      0.1000   |    1.1000      0.7100
                           0.0500      0.2000   |    1.4000      0.8900
                           0.4000      0.2400   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2709)     10.710      2.579      1.33      50.33
   OUTFLOW: ID= 1 (  5709)     10.710      0.512      2.00      50.33

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 19.84
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3185

--------------------------------------------------------------------------------

 FINISH
```

```
--------------------------------------------------------------------------------------------------------------
----------
  ********************************************
  ** SIMULATION : 50 year Fergus Shand Dam Chic **
  ********************************************

-------------------
| CHICAGO STORM    |    IDF curve parameters: A=3574.000
| Ptotal= 84.43 mm |                          B=  19.000
-------------------                           C=   0.924
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  4.00 hrs
                         Storm time step    =  5.00 min
                         Time to peak ratio =  0.33
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	3.36	1.00	29.13	2.00	15.89	3.00	5.24
0.08	3.68	1.08	47.79	2.08	13.89	3.08	4.93
0.17	4.06	1.17	98.38	2.17	12.28	3.17	4.65
0.25	4.51	1.25	189.90	2.25	10.96	3.25	4.40
0.33	5.08	1.33	119.63	2.33	9.87	3.33	4.17
0.42	5.77	1.42	77.23	2.42	8.95	3.42	3.96
0.50	6.66	1.50	54.63	2.50	8.18	3.50	3.77
0.58	7.83	1.58	41.06	2.58	7.51	3.58	3.60
0.67	9.40	1.67	32.23	2.67	6.93	3.67	3.44
0.75	11.60	1.75	26.13	2.75	6.42	3.75	3.29
0.83	14.86	1.83	21.72	2.83	5.98	3.83	3.15
0.92	20.04	1.92	18.43	2.92	5.59	3.92	3.03

CALIB			
NASHYD (0100)	Area (ha)= 136.98	Curve Number (CN)= 69.0	
ID= 1 DT= 2.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.17		

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

Unit Hyd Qpeak (cms)= 4.464

PEAK FLOW (cms)= 4.538 (i)
TIME TO PEAK (hrs)= 2.867
RUNOFF VOLUME (mm)= 32.598
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.386

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0201)	Area (ha)= 14.60	Curve Number (CN)= 74.0	
ID= 1 DT= 2.0 min	Ia (mm)= 1.50	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.97		

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

Unit Hyd Qpeak (cms)= 0.575

PEAK FLOW (cms)= 0.690 (i)
TIME TO PEAK (hrs)= 2.567
RUNOFF VOLUME (mm)= 39.945
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.473

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0203)	Area (ha)= 8.20		
ID= 1 DT= 2.0 min	Total Imp(%)= 45.00	Dir. Conn.(%)= 25.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.69	4.51
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.20	1.20
Length (m)=	25.00	25.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

Max.Eff.Inten.(mm/hr)= 174.65 101.33
over (min) 5.00 8.00
Storage Coeff. (min)= 0.84 (ii) 7.65 (ii)
Unit Hyd. Tpeak (min)= 4.00 8.00
Unit Hyd. peak (cms)= 0.53 0.15

			TOTALS
PEAK FLOW	(cms)=	1.06	0.97	1.627 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.37
RUNOFF VOLUME	(mm)=	82.43	41.59	51.80
TOTAL RAINFALL	(mm)=	84.43	84.43	84.43
RUNOFF COEFFICIENT	=	0.98	0.49	0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2200)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	14.60	0.690	2.57	39.94
+ ID2= 2 (0203):	8.20	1.627	1.37	51.80
ID = 3 (2200):	22.80	1.661	1.37	44.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(5200)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1980	0.2314
	0.0040	0.0218	0.2920	0.2621
	0.0060	0.0446	0.3980	0.2937
	0.0070	0.0683	0.5150	0.3261
	0.0080	0.0930	0.8290	0.3592
	0.0090	0.1187	1.3520	0.3930
	0.0230	0.1453	2.0570	0.4275
	0.0610	0.1730	2.9590	0.4629
	0.1200	0.2017	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2200)	22.800	1.661	1.37	44.21
OUTFLOW: ID= 1 (5200)	22.800	0.836	2.70	43.77

PEAK FLOW REDUCTION [Qout/Qin](%)= 50.33
TIME SHIFT OF PEAK FLOW (min)= 80.00
MAXIMUM STORAGE USED (ha.m.)= 0.3597

**** WARNING : SELECTED ROUTING TIME STEP DENIED.

CALIB			
NASHYD (0205)	Area (ha)= 4.80	Curve Number (CN)= 90.0	
ID= 1 DT= 2.0 min	Ia (mm)= 1.50	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.41		

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

Unit Hyd Qpeak (cms)= 0.447

PEAK FLOW (cms)= 0.668 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 61.874

```
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.733

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     174.65       101.33
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       0.84 (ii)    7.65 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.15
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02         0.040 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.37
     RUNOFF VOLUME    (mm)=      82.43        41.59         51.77
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.98         0.49          0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.668     1.83    61.87
     + ID2= 2 (  0206):     0.20   0.040     1.37    51.77
       ================================================
       ID = 3 (  2201):     5.00   0.683     1.83    61.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.683     1.83    61.47
     + ID2= 2 (  5200):    22.80   0.836     2.70    43.77
       ================================================
       ID = 1 (  2201):    27.80   1.192     2.23    46.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     174.65       70.28
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.03 (ii)    9.77 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.51         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.31         0.349 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53          1.53
     RUNOFF VOLUME    (mm)=      82.43        36.53         40.20
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.98         0.43          0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     174.65       101.33
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       0.84 (ii)    7.65 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.15
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.15         0.258 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.37
     RUNOFF VOLUME    (mm)=      82.43        41.59         51.79
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.98         0.49          0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
        ID1= 1 (  0207):     1.30   0.258     1.37    51.79
      + ID2= 2 (  0209):     2.70   0.349     1.53    40.20
        ================================================
        ID = 3 (  2202):     4.00   0.580     1.47    43.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2202):     4.00   0.580     1.47    43.97
      + ID2= 2 (  2201):    27.80   1.192     2.23    46.95
        ================================================
        ID = 1 (  2202):    31.80   1.368     1.87    46.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0100):   136.98   4.538     2.87    32.60
      + ID2= 2 (  2202):    31.80   1.368     1.87    46.58
        ================================================
        ID = 3 (  2100):   168.78   5.635     2.77    35.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.234 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  39.944
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.473

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     174.65       101.33
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.89 (ii)    8.08 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.53         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.57         0.50          0.806 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.37
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.80
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0302):     2.90   0.234     1.93    39.94
      + ID2= 2 (  0304):     4.40   0.806     1.37    51.80
        ================================================
        ID = 3 (  2300):     7.30   0.863     1.43    47.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     174.65       101.33
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.89 (ii)    8.08 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.53         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.02          0.037 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.37
     RUNOFF VOLUME    (mm)=      82.43        41.59          51.77
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.49           0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
```

```
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     174.65        70.28
               over (min)         5.00         8.00
     Storage Coeff.  (min)=       0.84 (ii)    7.99 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.70          0.807 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.47
     RUNOFF VOLUME    (mm)=      82.43        36.53          40.20
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.43           0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   0.863     1.43    47.09
     + ID2= 2 (  0308):     0.20   0.037     1.37    51.77
       ==================================================
       ID = 3 (  2301):     7.50   0.899     1.43    47.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   0.899     1.43    47.21
     + ID2= 2 (  0310):     5.70   0.807     1.47    40.20
       ==================================================
       ID = 1 (  2301):    13.20   1.704     1.47    44.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   5.635     2.77    35.23
     + ID2= 2 (  2301):    13.20   1.704     1.47    44.19
       ==================================================
       ID = 3 (  2302):   181.98   5.922     2.70    35.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 2.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00

     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     137.14        66.30
               over (min)        12.00        22.00
     Storage Coeff.  (min)=      12.40 (ii)   20.72 (ii)
     Unit Hyd. Tpeak (min)=      12.00        22.00
     Unit Hyd. peak  (cms)=       0.09         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.69         6.61          7.075 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.77           1.77
     RUNOFF VOLUME    (mm)=      82.43        35.21          36.63
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.98         0.42           0.43

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   5.922     2.70    35.88
     + ID2= 2 (  0400):    82.86   7.075     1.77    36.63
       ==================================================
       ID = 3 (  2400):   264.84  11.058     1.83    36.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 0.00         411.10        0.0550
                27.30         410.20        0.0550
                77.50         409.10        0.0550
                96.60         409.10        0.0550
               115.80         408.90        0.0550
               124.80         409.10        0.0550
               131.00         408.90    0.0550 /0.0350  Main Channel
               133.60         408.00        0.0350      Main Channel
               134.40         407.60        0.0350      Main Channel
               135.00         407.50        0.0350      Main Channel
               135.80         407.60        0.0350      Main Channel
               136.50         408.00        0.0350      Main Channel
               139.40         408.80    0.0350 /0.0550  Main Channel
               143.50         408.90        0.0550
               148.50         408.70        0.0550
               163.80         408.90        0.0550
               183.20         408.90        0.0550
               243.70         409.70        0.0550
               278.70         410.20        0.0550
               330.50         411.40        0.0550

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.19   407.69    .366E+03       0.1          0.51      58.83
```

0.37	407.87	.106E+04	0.5	0.81	37.08
0.56	408.06	.199E+04	1.1	1.00	29.93
0.74	408.24	.328E+04	2.1	1.14	26.32
0.93	408.43	.498E+04	3.6	1.28	23.32
1.11	408.61	.708E+04	5.6	1.43	20.94
1.30	408.80	.105E+05	8.5	1.45	20.61
1.49	408.99	.247E+05	14.8	1.07	27.91
1.68	409.18	.601E+05	30.4	0.91	32.97
1.87	409.37	.109E+06	58.5	0.96	31.05
2.06	409.56	.166E+06	98.3	1.06	28.11
2.25	409.75	.231E+06	150.3	1.17	25.57
2.44	409.94	.303E+06	215.4	1.28	23.46
2.64	410.14	.383E+06	293.8	1.38	21.74
2.83	410.33	.470E+06	390.1	1.49	20.10
3.02	410.52	.563E+06	502.4	1.60	18.66
3.21	410.71	.660E+06	628.8	1.71	17.48
3.40	410.90	.762E+06	769.5	1.81	16.49
3.59	411.09	.868E+06	924.9	1.91	15.65

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 2400)	264.84	11.06	1.83	36.12	1.38	1.27
OUTFLOW: ID= 1 (| 4400)	264.84	9.46	2.37	36.11	1.33	1.38

CALIB					
NASHYD	(0515)	Area	(ha)= 5.01	Curve Number	(CN)= 65.0
ID= 1 DT= 5.0 min		Ia	(mm)= 1.50	# of Linear Res.	(N)= 3.00
		U.H. Tp(hrs)= 0.41			

Unit Hyd Qpeak (cms)= 0.467

PEAK FLOW (cms)= 0.328 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 31.300
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD	(0510)	Area	(ha)= 91.44	Curve Number	(CN)= 71.0
ID= 1 DT= 5.0 min		Ia	(mm)= 1.50	# of Linear Res.	(N)= 3.00
		U.H. Tp(hrs)= 1.09			

Unit Hyd Qpeak (cms)= 3.204

PEAK FLOW (cms)= 3.635 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 36.841
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.436

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN	(4510)		
IN= 2---> OUT= 1	Routing time step (min)'	=	5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.206E+02	0.0	0.19	101.61
0.16	412.86	.822E+02	0.0	0.30	64.01
0.24	412.94	.185E+03	0.1	0.39	48.85
0.32	413.02	.329E+03	0.1	0.48	40.33
0.39	413.09	.514E+03	0.2	0.55	34.75
0.47	413.17	.740E+03	0.4	0.62	30.77
0.55	413.25	.101E+04	0.6	0.69	27.77
0.63	413.33	.132E+04	0.9	0.75	25.40
0.71	413.41	.166E+04	1.2	0.82	23.48
0.79	413.49	.206E+04	1.6	0.88	21.89
0.87	413.57	.249E+04	2.0	0.93	20.54
0.95	413.65	.296E+04	2.5	0.99	19.39
1.03	413.73	.347E+04	3.1	1.04	18.38
1.11	413.81	.403E+04	3.8	1.10	17.49
1.18	413.88	.462E+04	4.6	1.15	16.71
1.26	413.96	.526E+04	5.5	1.20	16.00
1.34	414.04	.594E+04	6.4	1.25	15.37
1.42	414.12	.666E+04	7.5	1.30	14.79
1.50	414.20	.742E+04	8.7	1.34	14.27

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0510)	91.44	3.64	2.75	36.84	1.08	1.08
OUTFLOW: ID= 1 (| 4510)	91.44	3.48	3.00	36.84	1.06	1.07

CALIB					
NASHYD	(0517)	Area	(ha)= 2.14	Curve Number	(CN)= 71.0
ID= 1 DT= 5.0 min		Ia	(mm)= 1.50	# of Linear Res.	(N)= 3.00
		U.H. Tp(hrs)= 0.32			

Unit Hyd Qpeak (cms)= 0.255

PEAK FLOW (cms)= 0.194 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 36.830
TOTAL RAINFALL (mm)= 84.430
RUNOFF COEFFICIENT = 0.436

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD	(0511)	Area	(ha)= 52.87		
ID= 1 DT= 5.0 min		Total Imp(%)= 50.00		Dir. Conn.(%)=	30.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	26.43	26.43	
Dep. Storage	(mm)=	0.80	1.50	
Average Slope	(%)=	1.00	1.00	
Length	(m)=	593.69	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		189.90	114.36	
over (min)		5.00	15.00	
Storage Coeff. (min)=		5.76 (ii)	13.99 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.20	0.08	
				TOTALS
PEAK FLOW	(cms)=	6.21	4.85	8.838 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.50
RUNOFF VOLUME	(mm)=	83.63	44.13	55.98

```
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.52           0.66


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        58.24
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.57 (ii)   14.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.26         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       2.21         0.62          2.415 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      83.63        36.84          57.90
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.44           0.69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   8.838     1.50    55.98
     + ID2= 2 (  0516):    10.78   2.415     1.33    57.90
       ================================================
       ID = 3 (  2511):    63.65  10.942     1.42    56.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  4511)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                        0.7700      0.9000   |    3.2130      1.6220
                        1.6000      1.1400   |    3.9540      1.8810
                        2.2900      1.2810   |    4.9000      2.3000

                             AREA     QPEAK     TPEAK       R.V.
                             (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2511)     63.650     10.942      1.42      56.30
   OUTFLOW: ID= 1 (  4511)     63.650      3.893      2.08      56.30

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 35.58
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.8626

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   3.482     3.00    36.84
     + ID2= 2 (  4511):    63.65   3.893     2.08    56.30
       ================================================
       ID = 3 (  2510):   155.09   6.454     2.58    44.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   6.454     2.58    44.82
     + ID2= 2 (  0517):     2.14   0.194     1.75    36.83
       ================================================
       ID = 1 (  2510):   157.23   6.517     2.58    44.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       114.36
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       4.71 (ii)   11.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.22         0.09
                                                        *TOTALS*
     PEAK FLOW       (cms)=       3.42         2.70          4.753 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.42
     RUNOFF VOLUME    (mm)=      83.63        44.13          55.98
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.52           0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
```

```
     Length            (m)=     207.20        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       175.96
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.06 (ii)    9.99 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.06         0.75         1.507 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      83.63        50.13         61.86
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.59          0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      1.51      1.42   61.86
     ================================================
     MAJOR SYS.(ID= 2):   1.24      0.78      1.42   61.86
     MINOR SYS.(ID= 3):   5.20      0.73      1.33   61.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0512):    27.13   4.753     1.42    55.98
      + ID2= 2 (  8512):     5.20   0.732     1.33    61.86
        ================================================
        ID = 3 (  2512):    32.33   5.485     1.42    56.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.6640      0.9151
                          0.0210      0.1601   |    0.8570      1.0220
                          0.0360      0.3317   |    1.0660      1.1320
                          0.0410      0.4218   |    1.2900      1.2450
                          0.1000      0.5147   |    1.5290      1.3610
                          0.2030      0.6105   |    1.7810      1.4800
                          0.3340      0.7092   |    2.0460      1.6020
                          0.4890      0.8107   |    2.3220      1.7260

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     32.335     5.485      1.42      56.92
   OUTFLOW: ID= 1 (  5512)     32.335     1.229      2.33      56.87

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.40
                  TIME SHIFT OF PEAK FLOW         (min)= 55.00

                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.2149

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2510):   157.23   6.517     2.58    44.71
      + ID2= 2 (  0515):     5.01   0.328     1.83    31.30
        ================================================
        ID = 3 (  2514):   162.24   6.678     2.58    44.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2514):   162.24   6.678     2.58    44.30
      + ID2= 2 (  5512):    32.33   1.229     2.33    56.87
        ================================================
        ID = 1 (  2514):   194.57   7.884     2.50    46.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0518)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.718 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  34.377
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.407

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2514):   194.57   7.884     2.50    46.39
      + ID2= 2 (  4400):   264.84   9.463     2.37    36.11
        ================================================
        ID = 3 (  2513):   459.41  17.315     2.47    40.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2513):   459.41  17.315     2.47    40.39
      + ID2= 2 (  0518):     6.68   0.718     1.58    34.38
        ================================================
        ID = 1 (  2513):   466.09  17.477     2.40    40.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
```

```
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=   3.733 (i)
     TIME TO PEAK    (hrs)=   2.900
     RUNOFF VOLUME    (mm)=  34.443
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   466.09  17.477     2.40    40.30
     + ID2= 2 (  0520):   108.36   3.733     2.90    34.44
       ================================================
       ID = 3 (  2520):   574.45  20.916     2.57    39.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         409.70        0.0550
                  19.70         408.80        0.0550
                  41.70         407.20        0.0550
                  60.50         405.30        0.0550
                  80.00         404.50        0.0550
                  95.70         404.60    0.0550 /0.0350  Main Channel
                  98.60         403.40        0.0350      Main Channel
                 100.40         403.40        0.0350      Main Channel
                 100.80         402.90        0.0350      Main Channel
                 101.50         402.70        0.0350      Main Channel
                 102.30         402.80        0.0350      Main Channel
                 103.30         403.20        0.0350      Main Channel
                 104.00         403.20        0.0350      Main Channel
                 105.60         404.40    0.0350 /0.0550  Main Channel
                 109.70         404.30        0.0550
                 128.60         404.20        0.0550
                 154.10         405.40        0.0550
                 179.10         406.70        0.0550
                 201.90         408.60        0.0550
                 224.20         410.60        0.0550

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.34   403.04    .954E+03       0.3          0.70      47.40
       0.68   403.38    .304E+04       1.6          1.03      32.27
       1.02   403.72    .718E+04       4.5          1.25      26.57
       1.36   404.06    .122E+05       9.7          1.58      20.96
       1.70   404.40    .251E+05      18.1          1.44      23.04
       2.08   404.78    .650E+05      42.3          1.29      25.62
       2.46   405.16    .122E+06      86.3          1.40      23.62
       2.84   405.54    .192E+06     151.6          1.57      21.10
       3.21   405.91    .270E+06     238.3          1.75      18.90
       3.59   406.29    .357E+06     345.8          1.93      17.20
       3.97   406.67    .452E+06     474.9          2.09      15.85
       4.35   407.05    .554E+06     631.1          2.26      14.63
       4.73   407.43    .663E+06     807.8          2.42      13.67
       5.11   407.81    .779E+06    1006.4          2.57      12.89
       5.49   408.19    .902E+06    1229.0          2.71      12.23
       5.86   408.56    .103E+07    1476.4          2.84      11.66
       6.24   408.94    .117E+07    1745.6          2.96      11.18
       6.62   409.32    .132E+07    2034.5          3.07      10.79
       7.00   409.70    .147E+07    2353.2          3.17      10.44

                                  <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2520)  574.45    20.92    2.57  39.20      1.74      1.42
   OUTFLOW: ID= 1 (  4500)  574.45    19.45    3.03  39.19      1.72      1.43

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.00

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   3.084 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  34.443
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   574.45  19.453     3.03    39.19
     + ID2= 2 (  0610):    78.05   3.084     2.67    34.44
       ================================================
       ID = 3 (  2610):   652.50  22.359     2.97    38.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   0.978 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  33.444
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
```

```
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       356.02
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.61 (ii)    2.27 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.09         0.377 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      83.91        60.21         76.80
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.71          0.91

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       129.27
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    7.30 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.41         0.21         0.527 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      83.91        45.60         60.92
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.54          0.72

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.527     1.33    60.92
     + ID2= 2 (  6240):     0.79   0.377     1.33    76.80
       ================================================
       ID = 3 ( 26240):     2.75   0.904     1.33    65.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1390      0.0686
                          0.0060      0.0042   |    0.1510      0.0822
                          0.0130      0.0130   |    0.1630      0.0967
                          0.0200      0.0250   |    0.1730      0.1121
                          0.0250      0.0328   |    0.1780      0.1202
                          0.0290      0.0439   |    2.5750      0.1742
                          0.1260      0.0558   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)     2.750     0.904      1.33      65.48
   OUTFLOW: ID= 1 ( 46240)     2.750     0.167      1.92      65.42

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.48
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1030

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       106.62
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.93 (ii)    7.81 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.12          0.173 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      83.91        42.81         51.03
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.51          0.60

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.2590      0.0708
                          0.0050      0.0089   |    0.2910      0.0871
                          0.0100      0.0187   |    0.3210      0.1045
                          0.0130      0.0298   |    0.3720      0.1438
                          0.0150      0.0422   |    2.8080      0.2087
                          0.2220      0.0559   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
```

```
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)     0.920     0.173     1.42      51.03
   OUTFLOW: ID= 1 ( 46220)     0.920     0.014     2.92      50.54

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.04
                  TIME SHIFT OF PEAK FLOW         (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0355

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.05         0.43
     Dep. Storage     (mm)=      0.52         7.16
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     20.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    189.90        71.26
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      0.61 (ii)    5.94 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.15
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.01         0.07         0.073 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=     83.91        37.17         39.50
     TOTAL RAINFALL   (mm)=     84.43        84.43         84.43
     RUNOFF COEFFICIENT   =      0.99         0.44          0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  ( 26200)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.014     2.92    50.54
     + ID2= 2 ( 46240):     2.75   0.167     1.92    65.42
       ================================================
       ID = 3 ( 26200):     3.67   0.180     2.00    61.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  ( 26200)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 ( 26200):     3.67   0.180     2.00    61.69
     + ID2= 2 (  6230):     0.48   0.073     1.42    39.50
       ================================================
       ID = 1 ( 26200):     4.15   0.230     1.50    59.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0149)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
             <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation      Manning
                 0.00         414.20       0.0350      Main Channel
                 4.30         412.70       0.0350      Main Channel
                 8.60         414.20       0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55        7.70
       0.16   412.86    .182E+02       0.1          0.88        4.85
       0.24   412.94    .410E+02       0.2          1.15        3.70
       0.32   413.02    .729E+02       0.4          1.39        3.05
       0.39   413.09    .114E+03       0.7          1.61        2.63
       0.47   413.17    .164E+03       1.2          1.82        2.33
       0.55   413.25    .223E+03       1.8          2.02        2.10
       0.63   413.33    .292E+03       2.5          2.21        1.92
       0.71   413.41    .369E+03       3.5          2.39        1.78
       0.79   413.49    .456E+03       4.6          2.56        1.66
       0.87   413.57    .551E+03       5.9          2.73        1.56
       0.95   413.65    .656E+03       7.4          2.89        1.47
       1.03   413.73    .770E+03       9.2          3.05        1.39
       1.11   413.81    .893E+03      11.2          3.21        1.32
       1.18   413.88    .103E+04      13.5          3.36        1.27
       1.26   413.96    .117E+04      16.0          3.51        1.21
       1.34   414.04    .132E+04      18.9          3.65        1.16
       1.42   414.12    .148E+04      22.0          3.79        1.12
       1.50   414.20    .165E+04      25.4          3.93        1.08

                                <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                           (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 26200)    4.15     0.23    1.50  59.12      0.25      1.19
   OUTFLOW: ID= 1 (  0149)    4.15     0.23    1.58  59.12      0.26      1.20

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD ( 96211)|   Area    (ha)=   0.61
|ID= 1 DT= 5.0 min |   Total Imp(%)=  58.00   Dir. Conn.(%)=  40.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.35         0.26
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     63.77        30.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    189.90       110.01
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      1.51 (ii)    6.19 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.33         0.15
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.13         0.06         0.161 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=     83.43        41.68         58.38
     TOTAL RAINFALL   (mm)=     84.43        84.43         84.43
     RUNOFF COEFFICIENT   =      0.99         0.49          0.69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0          0.55       7.70
       0.16   412.86    .182E+02       0.1          0.88       4.85
       0.24   412.94    .410E+02       0.2          1.15       3.70
       0.32   413.02    .729E+02       0.4          1.39       3.05
       0.39   413.09    .114E+03       0.7          1.61       2.63
       0.47   413.17    .164E+03       1.2          1.82       2.33
       0.55   413.25    .223E+03       1.8          2.02       2.10
       0.63   413.33    .292E+03       2.5          2.21       1.92
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                                   AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                   (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 ( 96211)    0.61     0.16    1.33  58.38      0.22      1.08
   OUTFLOW: ID= 1 (  0009)    0.61     0.15    1.42  58.35      0.21      1.05



--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0147)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0149):     4.15   0.235     1.58    59.12
     + ID2= 2 (  0627):     9.39   0.978     1.58    33.44
       ====================================================
       ID = 3 (  0147):    13.54   1.213     1.58    41.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0147)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0147):    13.54   1.213     1.58    41.31
     + ID2= 2 (  0009):     0.61   0.149     1.42    58.35
       ====================================================
       ID = 1 (  0147):    14.15   1.318     1.58    42.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9621)|   Area    (ha)=  16.18
|ID= 1 DT= 5.0 min |   Total Imp(%)=  32.00   Dir. Conn.(%)=  20.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.18        11.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     328.43        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        84.15
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       4.03 (ii)   10.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.24         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.43         1.67          2.422 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58          1.50
     RUNOFF VOLUME    (mm)=      83.43        39.36         48.17
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.47          0.57

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8621)|   Area    (ha)=   4.69
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.69         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     162.04        64.26
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.80 (ii)    0.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                          *TOTALS*
     PEAK FLOW       (cms)=       2.11         0.00          2.107 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      59.43        35.86         59.43
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.70         0.42          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8623)|   Area    (ha)=   2.05
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.05         0.00
```

```
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     162.04       103.44
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.80 (ii)    0.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.92         0.00         0.921 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      59.43        53.83         59.43
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.70         0.64          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9623)|   Area    (ha)=   4.42
|ID= 1 DT= 5.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  35.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.12         2.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     171.66        30.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        92.87
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.73 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.29         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.75         0.42          0.973 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      83.43        40.67         55.64
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.48          0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8624)|   Area    (ha)=   4.32
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.32         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     162.04        64.26
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.80 (ii)    0.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.94         0.00          1.941 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      59.43        35.86         59.43
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.70         0.42          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9624)|   Area    (ha)=   8.46
|ID= 1 DT= 5.0 min |   Total Imp(%)=  51.00   Dir. Conn.(%)=  40.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.31         4.15
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     237.49        30.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        89.82
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.32 (ii)    8.30 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.26         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.57         0.75          1.974 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      83.43        40.23         57.51
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.48          0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0628)|   Area    (ha)=   5.35
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.21         2.14
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     188.86        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       124.08
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.89 (ii)    9.37 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.28         0.12
```

```
                                                    *TOTALS*
     PEAK FLOW       (cms)=       1.02         0.51          1.301 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      83.43        44.62          60.14
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.99         0.53           0.71

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8625)|   Area    (ha)=   4.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.11         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     162.04       103.44
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.80 (ii)    0.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                    *TOTALS*
     PEAK FLOW       (cms)=       1.85         0.00          1.846 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      59.43        53.83          59.43
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43
     RUNOFF COEFFICIENT   =       0.70         0.64           0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9625)|   Area    (ha)=   8.07
|ID= 1 DT= 5.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  40.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.44         3.63
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     231.95        30.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90       103.02
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.27 (ii)    8.09 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.13
                                                    *TOTALS*
     PEAK FLOW       (cms)=       1.50         0.76          1.919 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      83.43        42.07          58.62
     TOTAL RAINFALL   (mm)=      84.43        84.43          84.43

     RUNOFF COEFFICIENT   =       0.99         0.50           0.69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0628):     5.35   1.301     1.33    60.14
     + ID2= 2 (  8621):     4.69   2.107     1.33    59.43
       ================================================
       ID = 3 (  2621):    10.04   3.408     1.33    59.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    10.04   3.408     1.33    59.81
     + ID2= 2 (  8623):     2.05   0.921     1.33    59.43
       ================================================
       ID = 1 (  2621):    12.09   4.329     1.33    59.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    12.09   4.329     1.33    59.74
     + ID2= 2 (  8624):     4.32   1.941     1.33    59.43
       ================================================
       ID = 3 (  2621):    16.41   6.269     1.33    59.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    16.41   6.269     1.33    59.66
     + ID2= 2 (  8625):     4.11   1.846     1.33    59.43
       ================================================
       ID = 1 (  2621):    20.52   8.116     1.33    59.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    20.52   8.116     1.33    59.62
     + ID2= 2 (  9621):    16.18   2.422     1.50    48.17
       ================================================
       ID = 3 (  2621):    36.70  10.133     1.33    54.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    36.70  10.133     1.33    54.57
     + ID2= 2 (  9623):     4.42   0.973     1.33    55.64
       ================================================
       ID = 1 (  2621):    41.12  11.105     1.33    54.69

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    41.12  11.105     1.33    54.69
     + ID2= 2 (  9624):     8.46   1.974     1.33    57.51
       ================================================
       ID = 3 (  2621):    49.58  13.080     1.33    55.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    49.58  13.080     1.33    55.17
     + ID2= 2 (  9625):     8.07   1.919     1.33    58.62
       ================================================
       ID = 1 (  2621):    57.65  14.999     1.33    55.65

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5621)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    1.5000      2.5000
                           0.0010      0.0000   |    2.5000      3.0000
                           0.0100      1.0000   |    3.0000      3.5000
                           0.0500      1.5000   |    4.0000      4.0000
                           0.5000      2.0000   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2621)     57.650     14.999      1.33      55.65
   OUTFLOW: ID= 1 (  5621)     57.650      1.386      2.50      43.58

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.24
                  TIME SHIFT OF PEAK FLOW         (min)= 70.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  2.4434

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9622)|   Area    (ha)=   6.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  44.00   Dir. Conn.(%)=  30.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.97         3.78
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     212.13        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     189.90        92.87
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.10 (ii)    9.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.95         0.68          1.357 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      83.43        40.67         53.50
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.48          0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8622)|   Area    (ha)=   2.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.99   Dir. Conn.(%)=  99.99
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.20         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     162.04       103.44
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.80 (ii)    0.95 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.99         0.00          0.988 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      59.43        53.83         59.43
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.70         0.64          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8622):     2.20   0.988     1.33    59.43
     + ID2= 2 (  9622):     6.75   1.357     1.42    53.50
       ================================================
       ID = 3 (  2622):     8.95   2.304     1.33    54.96

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5622)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.4500      0.2500
                           0.0010      0.0000   |    0.6500      0.3200
```

```
                        0.0030      0.1200   |    0.8000      0.4000
                        0.1000      0.1500   |    0.9800      0.5000
                        0.3000      0.2000   |    0.0000      0.0000

                             AREA     QPEAK     TPEAK       R.V.
                             (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2622)      8.950      2.304      1.33      54.96
   OUTFLOW: ID= 1 (  5622)      8.950      0.529      1.92      53.93

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.94
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2781

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  5621):    57.65   1.386     2.50    43.58
     + ID2= 2 (  5622):     8.95   0.529     1.92    53.93
       ================================================
       ID = 3 (  2625):    66.60   1.838     2.33    44.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0150)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0147):    14.15   1.318     1.58    42.05
     + ID2= 2 (  2625):    66.60   1.838     2.33    44.97
       ================================================
       ID = 3 (  0150):    80.75   2.376     2.08    44.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0150):    80.75   2.376     2.08    44.46
     + ID2= 2 (  2610):   652.50  22.359     2.97    38.63
       ================================================
       ID = 3 (  2620):   733.25  24.303     2.90    38.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.42   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.608

     PEAK FLOW       (cms)=   0.877 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  33.444
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38

     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   2.438 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  33.503
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17       47.72
       0.16   412.86    .357E+02       0.0          0.28       30.06
       0.24   412.94    .804E+02       0.1          0.36       22.94
       0.32   413.02    .143E+03       0.1          0.44       18.94
       0.39   413.09    .223E+03       0.2          0.51       16.32
       0.47   413.17    .322E+03       0.4          0.58       14.45
       0.55   413.25    .438E+03       0.6          0.64       13.04
       0.63   413.33    .572E+03       0.8          0.70       11.93
       0.71   413.41    .724E+03       1.1          0.76       11.03
       0.79   413.49    .893E+03       1.4          0.81       10.28
       0.87   413.57    .108E+04       1.9          0.86        9.65
       0.95   413.65    .129E+04       2.4          0.92        9.10
       1.03   413.73    .151E+04       2.9          0.97        8.63
       1.11   413.81    .175E+04       3.6          1.01        8.22
       1.18   413.88    .201E+04       4.3          1.06        7.85
       1.26   413.96    .229E+04       5.1          1.11        7.52
       1.34   414.04    .258E+04       6.0          1.15        7.22
       1.42   414.12    .289E+04       6.9          1.20        6.95
       1.50   414.20    .323E+04       8.0          1.24        6.70

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     2.44    1.83  33.50      0.96      0.92
   OUTFLOW: ID= 1 (  4630)   33.04     2.28    2.00  33.49      0.93      0.91

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):   733.25  24.303     2.90    38.77
     + ID2= 2 (  4630):    33.04   2.282     2.00    33.49
       ================================================
       ID = 3 (  2637):   766.29  25.189     2.87    38.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
```

```
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   766.29  25.189     2.87    38.54
     + ID2= 2 (  0637):     8.42   0.877     1.58    33.44
       ================================================
       ID = 1 (  2637):   774.71  25.308     2.87    38.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0636)|   Area    (ha)=   3.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.688

     PEAK FLOW       (cms)=   0.375 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  33.444
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   774.71  25.308     2.87    38.49
     + ID2= 2 (  0636):     3.60   0.375     1.58    33.44
       ================================================
       ID = 3 (  2636):   778.31  25.358     2.87    38.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   3.940

     PEAK FLOW       (cms)=   2.149 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  33.444
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0639)|   Area    (ha)=   4.47   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.854

     PEAK FLOW       (cms)=   0.466 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  33.444
     TOTAL RAINFALL   (mm)=  84.430
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   778.31  25.358     2.87    38.46
     + ID2= 2 (  0638):    20.63   2.149     1.58    33.44
       ================================================
       ID = 3 (  2630):   798.94  25.659     2.80    38.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   798.94  25.659     2.80    38.33
     + ID2= 2 (  0639):     4.47   0.466     1.58    33.44
       ================================================
       ID = 1 (  2630):   803.41  25.726     2.80    38.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8709)|   Area    (ha)=   3.51
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        3.51         0.00
     Dep. Storage     (mm)=       25.00         1.50
     Average Slope     (%)=        1.00         2.00
     Length            (m)=       20.00        40.00
     Mannings n           =       0.013        0.250

     Max.Eff.Inten.(mm/hr)=      162.04       103.44
               over (min)         5.00         5.00
     Storage Coeff.  (min)=        0.80 (ii)    0.86 (ii)
     Unit Hyd. Tpeak (min)=        5.00         5.00
     Unit Hyd. peak  (cms)=        0.34         0.34
                                                          *TOTALS*
     PEAK FLOW       (cms)=        1.58         0.00          1.577 (iii)
     TIME TO PEAK    (hrs)=        1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=       59.43        53.83          59.43
     TOTAL RAINFALL   (mm)=       84.43        84.43          84.43
     RUNOFF COEFFICIENT   =        0.70         0.64           0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9709)|   Area    (ha)=   7.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  40.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        4.03         3.17
     Dep. Storage     (mm)=        1.00         1.50
     Average Slope     (%)=        1.00         2.00
     Length            (m)=      219.09        30.00
     Mannings n           =       0.013        0.250

     Max.Eff.Inten.(mm/hr)=      189.90       106.78
               over (min)         5.00        10.00
```

```
     Storage Coeff.  (min)=       3.16 (ii)    7.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.35         0.69         1.732 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      83.43        42.56         58.91
     TOTAL RAINFALL   (mm)=      84.43        84.43         84.43
     RUNOFF COEFFICIENT   =       0.99         0.50          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2709)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8709):     3.51   1.577     1.33    59.43
     + ID2= 2 (  9709):     7.20   1.732     1.33    58.91
       ====================================================
       ID = 3 (  2709):    10.71   3.309     1.33    59.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5709)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.6000      0.3800
                          0.0010      0.0000   |    0.9000      0.5400
                          0.0100      0.1000   |    1.1000      0.7100
                          0.0500      0.2000   |    1.4000      0.8900
                          0.4000      0.2400   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2709)     10.710      3.309      1.33      59.08
   OUTFLOW: ID= 1 (  5709)     10.710      0.592      2.00      59.08

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.90
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3750

--------------------------------------------------------------------------------

 FINISH
```

```
----------
  ***********************************************
  ** SIMULATION : 100 year Fergus Shand Dam Chi **
  ***********************************************

-------------------
| CHICAGO STORM    |    IDF curve parameters: A=4382.000
| Ptotal= 94.08 mm |                          B=  21.000
-------------------                          C=   0.939
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  4.00 hrs
                         Storm time step    =  5.00 min
                         Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.55 |  1.00   33.31 |'  2.00   18.02 |  3.00    5.69
                0.08    3.91 |  1.08   54.51 |'  2.08   15.69 |  3.08    5.34
                0.17    4.34 |  1.17  109.99 |'  2.17   13.83 |  3.17    5.02
                0.25    4.86 |  1.25  205.33 |'  2.25   12.30 |  3.25    4.73
                0.33    5.50 |  1.33  132.84 |'  2.33   11.04 |  3.33    4.47
                0.42    6.30 |  1.42   87.25 |'  2.42    9.97 |  3.42    4.24
                0.50    7.33 |  1.50   62.23 |'  2.50    9.07 |  3.50    4.02
                0.58    8.67 |  1.58   46.93 |'  2.58    8.30 |  3.58    3.82
                0.67   10.48 |  1.67   36.86 |'  2.67    7.63 |  3.67    3.64
                0.75   13.04 |  1.75   29.86 |'  2.75    7.05 |  3.75    3.48
                0.83   16.82 |  1.83   24.77 |'  2.83    6.54 |  3.83    3.32
                0.92   22.83 |  1.92   20.96 |'  2.92    6.09 |  3.92    3.18

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 69.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Unit Hyd Qpeak  (cms)=   4.464

    PEAK FLOW       (cms)=   5.477 (i)
    TIME TO PEAK    (hrs)=   2.867
    RUNOFF VOLUME    (mm)=  39.054
    TOTAL RAINFALL   (mm)=  94.082
    RUNOFF COEFFICIENT   =   0.415

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Unit Hyd Qpeak  (cms)=   0.575

    PEAK FLOW       (cms)=   0.820 (i)
    TIME TO PEAK    (hrs)=   2.567
    RUNOFF VOLUME    (mm)=  47.141
    TOTAL RAINFALL   (mm)=  94.082
    RUNOFF COEFFICIENT   =   0.501

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       3.69         4.51
    Dep. Storage     (mm)=       2.00         5.00
    Average Slope     (%)=       1.20         1.20
    Length            (m)=      25.00        25.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Max.Eff.Inten.(mm/hr)=     189.44       118.35
              over (min)        5.00         8.00
    Storage Coeff.  (min)=       0.82 (ii)    7.40 (ii)
```

```
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.15         1.15          1.854 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.37
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.84
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   0.820     2.57    47.14
     + ID2= 2 (  0203):     8.20   1.854     1.37    59.84
       ==================================================
       ID = 3 (  2200):    22.80   1.906     1.43    51.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000  |    0.1980      0.2314
                           0.0040      0.0218  |    0.2920      0.2621
                           0.0060      0.0446  |    0.3980      0.2937
                           0.0070      0.0683  |    0.5150      0.3261
                           0.0080      0.0930  |    0.8290      0.3592
                           0.0090      0.1187  |    1.3520      0.3930
                           0.0230      0.1453  |    2.0570      0.4275
                           0.0610      0.1730  |    2.9590      0.4629
                           0.1200      0.2017  |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2200)     22.800     1.906      1.43      51.71
   OUTFLOW: ID= 1 (  5200)     22.800     1.034      2.50      51.27

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 54.24
                  TIME SHIFT OF PEAK FLOW         (min)= 64.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3724

     **** WARNING : SELECTED ROUTING TIME STEP DENIED.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 90.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.768 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  70.953
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.754

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     189.44       118.35
               over (min)          5.00         8.00
     Storage Coeff.  (min)=       0.82 (ii)    7.40 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.045 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.37
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.82
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.768     1.83    70.95
     + ID2= 2 (  0206):     0.20   0.045     1.37    59.82
       ==================================================
       ID = 3 (  2201):     5.00   0.785     1.83    70.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.785     1.83    70.51
     + ID2= 2 (  5200):    22.80   1.034     2.50    51.27
       ==================================================
       ID = 1 (  2201):    27.80   1.564     2.17    54.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.43         2.27
     Dep. Storage     (mm)=       2.00         5.00
```

```
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      35.00        35.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     189.44        82.86
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.00 (ii)    9.18 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.51         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.37         0.422 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.53          1.50
     RUNOFF VOLUME    (mm)=      92.08        43.49         47.38
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.98         0.46          0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.58         0.72
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     189.44       118.35
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       0.82 (ii)    7.40 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.15
                                                       *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.18         0.294 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.37
     RUNOFF VOLUME    (mm)=      92.08        49.10         59.84
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.98         0.52          0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0207):     1.30   0.294     1.37    59.84
      + ID2= 2 (  0209):     2.70   0.422     1.50    47.38
        ==================================================
        ID = 3 (  2202):     4.00   0.691     1.47    51.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2202):     4.00   0.691     1.47    51.43
      + ID2= 2 (  2201):    27.80   1.564     2.17    54.73
        ==================================================
        ID = 1 (  2202):    31.80   1.762     2.00    54.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0100):   136.98   5.477     2.87    39.05
      + ID2= 2 (  2202):    31.80   1.762     2.00    54.31
        ==================================================
        ID = 3 (  2100):   168.78   6.788     2.73    41.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 74.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.45

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.246

     PEAK FLOW       (cms)=   0.277 (i)
     TIME TO PEAK    (hrs)=   1.933
     RUNOFF VOLUME    (mm)=  47.141
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.501

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     189.44       118.35
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       0.86 (ii)    7.82 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.14
                                                       *TOTALS*
     PEAK FLOW       (cms)=       0.62         0.61          0.983 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.37
     RUNOFF VOLUME    (mm)=      92.08        49.10          59.84
```

```
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.52           0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0302):     2.90   0.277     1.93    47.14
     + ID2= 2 (  0304):     4.40   0.983     1.37    59.84
       ====================================================
       ID = 3 (  2300):     7.30   1.051     1.43    54.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     189.44       118.35
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       0.86 (ii)    7.82 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03         0.045 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.37
     RUNOFF VOLUME    (mm)=      92.08        49.10         59.82
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.98         0.52          0.64

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     189.44        82.86
               over (min)        5.00         8.00
     Storage Coeff.  (min)=       0.82 (ii)    7.51 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.53         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.85          0.971 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.47
     RUNOFF VOLUME    (mm)=      92.08        43.49         47.38
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.98         0.46          0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2300):     7.30   1.051     1.43    54.80
     + ID2= 2 (  0308):     0.20   0.045     1.37    59.82
       ====================================================
       ID = 3 (  2301):     7.50   1.095     1.43    54.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2301)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   1.095     1.43    54.93
     + ID2= 2 (  0310):     5.70   0.971     1.47    47.38
       ====================================================
       ID = 1 (  2301):    13.20   2.064     1.43    51.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78   6.788     2.73    41.93
     + ID2= 2 (  2301):    13.20   2.064     1.43    51.67
       ====================================================
       ID = 3 (  2302):   181.98   7.129     2.67    42.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 2.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
```

```
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=     157.34        78.34
               over (min)       12.00        20.00
     Storage Coeff.  (min)=      11.74 (ii)   19.52 (ii)
     Unit Hyd. Tpeak (min)=      12.00        20.00
     Unit Hyd. peak  (cms)=       0.10         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.78         8.21          8.766 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.73           1.73
     RUNOFF VOLUME    (mm)=      92.08        42.01          43.51
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.98         0.45           0.46

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98   7.129     2.67    42.64
      + ID2= 2 (  0400):    82.86   8.766     1.73    43.51
        ==================================================
        ID = 3 (  2400):   264.84  13.433     1.77    42.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        411.10        0.0550
                  27.30        410.20        0.0550
                  77.50        409.10        0.0550
                  96.60        409.10        0.0550
                 115.80        408.90        0.0550
                 124.80        409.10        0.0550
                 131.00        408.90    0.0550 /0.0350  Main Channel
                 133.60        408.00        0.0350      Main Channel
                 134.40        407.60        0.0350      Main Channel
                 135.00        407.50        0.0350      Main Channel
                 135.80        407.60        0.0350      Main Channel
                 136.50        408.00        0.0350      Main Channel
                 139.40        408.80    0.0350 /0.0550  Main Channel
                 143.50        408.90        0.0550
                 148.50        408.70        0.0550
                 163.80        408.90        0.0550
                 183.20        408.90        0.0550
                 243.70        409.70        0.0550
                 278.70        410.20        0.0550
                 330.50        411.40        0.0550

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.19   407.69    .366E+03       0.1          0.51      58.83
      0.37   407.87    .106E+04       0.5          0.81      37.08
      0.56   408.06    .199E+04       1.1          1.00      29.93
      0.74   408.24    .328E+04       2.1          1.14      26.32
      0.93   408.43    .498E+04       3.6          1.28      23.32
      1.11   408.61    .708E+04       5.6          1.43      20.94
      1.30   408.80    .105E+05       8.5          1.45      20.61
      1.49   408.99    .247E+05      14.8          1.07      27.91
      1.68   409.18    .601E+05      30.4          0.91      32.97
      1.87   409.37    .109E+06      58.5          0.96      31.05
      2.06   409.56    .166E+06      98.3          1.06      28.11
      2.25   409.75    .231E+06     150.3          1.17      25.57
      2.44   409.94    .303E+06     215.4          1.28      23.46
      2.64   410.14    .383E+06     293.8          1.38      21.74
      2.83   410.33    .470E+06     390.1          1.49      20.10
      3.02   410.52    .563E+06     502.4          1.60      18.66
      3.21   410.71    .660E+06     628.8          1.71      17.48
      3.40   410.90    .762E+06     769.5          1.81      16.49
      3.59   411.09    .868E+06     924.9          1.91      15.65

                                 <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
     INFLOW : ID= 2 (  2400)  264.84    13.43    1.77  42.91      1.45      1.14
     OUTFLOW: ID= 1 (  4400)  264.84    11.18    2.43  42.91      1.38      1.26


--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 65.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

     Unit Hyd Qpeak  (cms)=   0.467

     PEAK FLOW       (cms)=   0.393 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  37.368
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.09

     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   4.338 (i)
     TIME TO PEAK    (hrs)=   2.667
     RUNOFF VOLUME    (mm)=  43.658
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.464

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
```

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.206E+02	0.0	0.19	101.61
0.16	412.86	.822E+02	0.0	0.30	64.01
0.24	412.94	.185E+03	0.1	0.39	48.85
0.32	413.02	.329E+03	0.1	0.48	40.33
0.39	413.09	.514E+03	0.2	0.55	34.75
0.47	413.17	.740E+03	0.4	0.62	30.77
0.55	413.25	.101E+04	0.6	0.69	27.77
0.63	413.33	.132E+04	0.9	0.75	25.40
0.71	413.41	.166E+04	1.2	0.82	23.48
0.79	413.49	.206E+04	1.6	0.88	21.89
0.87	413.57	.249E+04	2.0	0.93	20.54
0.95	413.65	.296E+04	2.5	0.99	19.39
1.03	413.73	.347E+04	3.1	1.04	18.38
1.11	413.81	.403E+04	3.8	1.10	17.49
1.18	413.88	.462E+04	4.6	1.15	16.71
1.26	413.96	.526E+04	5.5	1.20	16.00
1.34	414.04	.594E+04	6.4	1.25	15.37
1.42	414.12	.666E+04	7.5	1.30	14.79
1.50	414.20	.742E+04	8.7	1.34	14.27

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0510)	91.44	4.34	2.67	43.66	1.16	1.13
OUTFLOW: ID= 1 (4510)	91.44	4.17	3.00	43.65	1.14	1.11

CALIB	
NASHYD (0517)	Area (ha)= 2.14 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min	Ia (mm)= 1.50 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.32

Unit Hyd Qpeak (cms)= 0.255

PEAK FLOW (cms)= 0.231 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 43.645
TOTAL RAINFALL (mm)= 94.082
RUNOFF COEFFICIENT = 0.464

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0511)	Area (ha)= 52.87
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 30.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	26.43	26.43
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	593.69	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	205.33	132.52
over (min)	5.00	15.00
Storage Coeff. (min)=	5.58 (ii)	13.34 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.20	0.08
		TOTALS
PEAK FLOW (cms)=	6.85	5.80 10.226 (iii)
TIME TO PEAK (hrs)=	1.33	1.58 1.50
RUNOFF VOLUME (mm)=	93.28	51.77 64.22
TOTAL RAINFALL (mm)=	94.08	94.08 94.08
RUNOFF COEFFICIENT =	0.99	0.55 0.68

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0516)	Area (ha)= 10.78
ID= 1 DT= 5.0 min	Total Imp(%)= 45.00 Dir. Conn.(%)= 45.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.85	5.93
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	268.08	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	205.33	77.66
over (min)	5.00	15.00
Storage Coeff. (min)=	3.46 (ii)	13.08 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.26	0.08
		TOTALS
PEAK FLOW (cms)=	2.42	0.77 2.681 (iii)
TIME TO PEAK (hrs)=	1.33	1.58 1.33
RUNOFF VOLUME (mm)=	93.28	43.66 65.99
TOTAL RAINFALL (mm)=	94.08	94.08 94.08
RUNOFF COEFFICIENT =	0.99	0.46 0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2511)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0511):	52.87	10.226	1.50	64.22
	+ ID2= 2 (0516):	10.78	2.681	1.33	65.99
	ID = 3 (2511):	63.65	12.493	1.42	64.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(4511)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.7700	0.9000	3.2130	1.6220
	1.6000	1.1400	3.9540	1.8810
	2.2900	1.2810	4.9000	2.3000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2511)	63.650	12.493	1.42	64.52
OUTFLOW: ID= 1 (4511)	63.650	4.489	2.08	64.52

PEAK FLOW REDUCTION [Qout/Qin](%)= 35.93
TIME SHIFT OF PEAK FLOW (min)= 40.00

```
                  MAXIMUM  STORAGE   USED       (ha.m.)=  2.1214
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4510):    91.44   4.166     3.00    43.65
     + ID2= 2 (  4511):    63.65   4.489     2.08    64.52
       ================================================
       ID = 3 (  2510):   155.09   7.715     2.58    52.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09   7.715     2.58    52.21
     + ID2= 2 (  0517):     2.14   0.231     1.75    43.65
       ================================================
       ID = 1 (  2510):   157.23   7.789     2.58    52.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     13.56        13.56
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=    425.28        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    205.33       132.52
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      4.57 (ii)   10.87 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.23         0.09
                                                       *TOTALS*
     PEAK FLOW       (cms)=      3.76         3.21        5.472 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.58         1.50
     RUNOFF VOLUME    (mm)=     93.28        51.77        64.22
     TOTAL RAINFALL   (mm)=     94.08        94.08        94.08
     RUNOFF COEFFICIENT   =      0.99         0.55         0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.19         2.25
     Dep. Storage     (mm)=      0.80         1.50
     Average Slope     (%)=      1.00         1.00
     Length            (m)=    207.20        40.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    205.33       202.03
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      2.97 (ii)    9.52 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.28         0.12
                                                       *TOTALS*
     PEAK FLOW       (cms)=      1.16         0.88         1.720 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=     93.28        58.34         70.57
     TOTAL RAINFALL   (mm)=     94.08        94.08         94.08
     RUNOFF COEFFICIENT   =      0.99         0.62          0.75

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  71.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
-------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      1.72      1.42   70.57
     ================================================
     MAJOR SYS.(ID= 2):   1.54      0.99      1.42   70.57
     MINOR SYS.(ID= 3):   4.90      0.73      1.25   70.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   5.472     1.50    64.22
     + ID2= 2 (  8512):     4.90   0.732     1.25    70.57
       ================================================
       ID = 3 (  2512):    32.03   6.204     1.50    65.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5512)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.6640      0.9151
                           0.0210      0.1601   |    0.8570      1.0220
                           0.0360      0.3317   |    1.0660      1.1320
                           0.0410      0.4218   |    1.2900      1.2450
                           0.1000      0.5147   |    1.5290      1.3610
                           0.2030      0.6105   |    1.7810      1.4800
                           0.3340      0.7092   |    2.0460      1.6020
                           0.4890      0.8107   |    2.3220      1.7260

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2512)     32.033      6.204      1.50      65.19
   OUTFLOW: ID= 1 (  5512)     32.033      1.506      2.25      65.13

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 24.27
                  TIME SHIFT OF PEAK FLOW         (min)= 45.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.3505
```

```
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2510):   157.23   7.789     2.58    52.10
     + ID2= 2 (  0515):     5.01   0.393     1.83    37.37
       ==================================================
       ID = 3 (  2514):   162.24   7.983     2.58    51.64

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2514):   162.24   7.983     2.58    51.64
     + ID2= 2 (  5512):    32.03   1.506     2.25    65.13
       ==================================================
       ID = 1 (  2514):   194.27   9.433     2.50    53.87

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| CALIB            |
| NASHYD   (  0518)|   Area    (ha)=   6.68   Curve Number   (CN)= 71.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

    Unit Hyd Qpeak  (cms)=   1.276

    PEAK FLOW       (cms)=   0.861 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=  41.075
    TOTAL RAINFALL   (mm)=  94.082
    RUNOFF COEFFICIENT   =   0.437

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2514):   194.27   9.433     2.50    53.87
     + ID2= 2 (  4400):   264.84  11.182     2.43    42.91
       ==================================================
       ID = 3 (  2513):   459.11  20.601     2.50    47.47

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2513):   459.11  20.601     2.50    47.47
     + ID2= 2 (  0518):     6.68   0.861     1.58    41.08
       ==================================================
       ID = 1 (  2513):   465.79  20.779     2.47    47.38

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.20

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Unit Hyd Qpeak  (cms)=   3.449

    PEAK FLOW       (cms)=   4.493 (i)
    TIME TO PEAK    (hrs)=   2.900
    RUNOFF VOLUME    (mm)=  41.154
    TOTAL RAINFALL   (mm)=  94.082
    RUNOFF COEFFICIENT   =   0.437

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2513):   465.79  20.779     2.47    47.38
     + ID2= 2 (  0520):   108.36   4.493     2.90    41.15
       ==================================================
       ID = 3 (  2520):   574.15  24.955     2.57    46.20

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------

             <------ DATA FOR SECTION (   1.1) ------>
             Distance      Elevation       Manning
                 0.00         409.70        0.0550
                19.70         408.80        0.0550
                41.70         407.20        0.0550
                60.50         405.30        0.0550
                80.00         404.50        0.0550
                95.70         404.60    0.0550 /0.0350  Main Channel
                98.60         403.40        0.0350      Main Channel
               100.40         403.40        0.0350      Main Channel
               100.80         402.90        0.0350      Main Channel
               101.50         402.70        0.0350      Main Channel
               102.30         402.80        0.0350      Main Channel
               103.30         403.20        0.0350      Main Channel
               104.00         403.20        0.0350      Main Channel
               105.60         404.40    0.0350 /0.0550  Main Channel
               109.70         404.30        0.0550
               128.60         404.20        0.0550
               154.10         405.40        0.0550
               179.10         406.70        0.0550
               201.90         408.60        0.0550
               224.20         410.60        0.0550

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
       (m)       (m)     (cu.m.)       (cms)         (m/s)      (min)
      0.34    403.04    .954E+03         0.3          0.70      47.40
      0.68    403.38    .304E+04         1.6          1.03      32.27
      1.02    403.72    .718E+04         4.5          1.25      26.57
      1.36    404.06    .122E+05         9.7          1.58      20.96
      1.70    404.40    .251E+05        18.1          1.44      23.04
      2.08    404.78    .650E+05        42.3          1.29      25.62
      2.46    405.16    .122E+06        86.3          1.40      23.62
      2.84    405.54    .192E+06       151.6          1.57      21.10
      3.21    405.91    .270E+06       238.3          1.75      18.90
      3.59    406.29    .357E+06       345.8          1.93      17.20
      3.97    406.67    .452E+06       474.9          2.09      15.85
      4.35    407.05    .554E+06       631.1          2.26      14.63
      4.73    407.43    .663E+06       807.8          2.42      13.67
      5.11    407.81    .779E+06      1006.4          2.57      12.89
      5.49    408.19    .902E+06      1229.0          2.71      12.23
```

```
       5.86   408.56    .103E+07    1476.4          2.84      11.66
       6.24   408.94    .117E+07    1745.6          2.96      11.18
       6.62   409.32    .132E+07    2034.5          3.07      10.79
       7.00   409.70    .147E+07    2353.2          3.17      10.44

                                 <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2520)  574.15    24.96    2.57  46.20      1.81      1.39
   OUTFLOW: ID= 1 (  4500)  574.15    23.22    3.07  46.20      1.78      1.40



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 71.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.00

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   3.715 (i)
     TIME TO PEAK    (hrs)=   2.633
     RUNOFF VOLUME    (mm)=  41.154
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.437

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   574.15  23.222     3.07    46.20
     + ID2= 2 (  0610):    78.05   3.715     2.63    41.15
       ================================================
       ID = 3 (  2610):   652.20  26.703     2.97    45.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   1.174 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  40.015
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.425

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       402.32
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.59 (ii)    2.20 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.10         0.412 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      93.56        69.23         86.26
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.74          0.92

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       150.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    6.89 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.45         0.25         0.588 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      93.56        53.60         69.58
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.57          0.74

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  6210):     1.96   0.588     1.33    69.58
     + ID2= 2 (  6240):     0.79   0.412     1.33    86.26
       ================================================
       ID = 3 ( 26240):     2.75   1.000     1.33    74.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR( 46240)|     OVERFLOW IS OFF
```

```
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000      0.0000  |    0.1390      0.0686
                         0.0060      0.0042  |    0.1510      0.0822
                         0.0130      0.0130  |    0.1630      0.0967
                         0.0200      0.0250  |    0.1730      0.1121
                         0.0250      0.0328  |    0.1780      0.1202
                         0.0290      0.0439  |    2.5750      0.1742
                         0.1260      0.0558  |    0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 ( 26240)      2.750      1.000      1.33      74.37
   OUTFLOW: ID= 1 ( 46240)      2.750      0.177      2.00      74.31

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.73
                   TIME SHIFT OF PEAK FLOW         (min)= 40.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1192

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       124.69
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.90 (ii)    7.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.14         0.204 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      93.56        50.56         59.16
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.54          0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR( 46220)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000      0.0000  |    0.2590      0.0708
                         0.0050      0.0089  |    0.2910      0.0871
                         0.0100      0.0187  |    0.3210      0.1045
                         0.0130      0.0298  |    0.3720      0.1438
                         0.0150      0.0422  |    2.8080      0.2087
                         0.2220      0.0559  |    0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  6220)      0.920      0.204      1.42      59.16

   OUTFLOW: ID= 1 ( 46220)      0.920      0.015      3.00      58.67

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.34
                   TIME SHIFT OF PEAK FLOW         (min)= 95.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0420

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05         0.43
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       84.41
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.59 (ii)    5.58 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.16
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.08          0.088 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      93.56        44.35         46.80
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.47          0.50

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  74.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  ( 26200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 ( 46220):     0.92   0.015     3.00    58.67
     + ID2= 2 ( 46240):     2.75   0.177     2.00    74.31
       ================================================
       ID = 3 ( 26200):     3.67   0.191     2.00    70.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  ( 26200)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 ( 26200):     3.67   0.191     2.00    70.39
     + ID2= 2 (  6230):     0.48   0.088     1.42    46.80
       ================================================
       ID = 1 ( 26200):     4.15   0.255     1.50    67.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0149)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
             <------ DATA FOR SECTION (   1.1) ------>
```

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.456E+01	0.0	0.55	7.70
0.16	412.86	.182E+02	0.1	0.88	4.85
0.24	412.94	.410E+02	0.2	1.15	3.70
0.32	413.02	.729E+02	0.4	1.39	3.05
0.39	413.09	.114E+03	0.7	1.61	2.63
0.47	413.17	.164E+03	1.2	1.82	2.33
0.55	413.25	.223E+03	1.8	2.02	2.10
0.63	413.33	.292E+03	2.5	2.21	1.92
0.71	413.41	.369E+03	3.5	2.39	1.78
0.79	413.49	.456E+03	4.6	2.56	1.66
0.87	413.57	.551E+03	5.9	2.73	1.56
0.95	413.65	.656E+03	7.4	2.89	1.47
1.03	413.73	.770E+03	9.2	3.05	1.39
1.11	413.81	.893E+03	11.2	3.21	1.32
1.18	413.88	.103E+04	13.5	3.36	1.27
1.26	413.96	.117E+04	16.0	3.51	1.21
1.34	414.04	.132E+04	18.9	3.65	1.16
1.42	414.12	.148E+04	22.0	3.79	1.12
1.50	414.20	.165E+04	25.4	3.93	1.08

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (26200)	4.15	0.25	1.50	67.66	0.26	1.22
OUTFLOW: ID= 1 (0149)	4.15	0.26	1.58	67.66	0.26	1.22

CALIB STANDHYD (96211) ID= 1 DT= 5.0 min	Area (ha)= 0.61 Total Imp(%)= 58.00 Dir. Conn.(%)= 40.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.35	0.26
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	63.77	30.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	205.33	128.44
over (min)	5.00	10.00
Storage Coeff. (min)=	1.46 (ii)	6.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.15

			TOTALS
PEAK FLOW (cms)=	0.14	0.07	0.179 (iii)
TIME TO PEAK (hrs)=	1.33	1.50	1.33
RUNOFF VOLUME (mm)=	93.08	49.20	66.74
TOTAL RAINFALL (mm)=	94.08	94.08	94.08
RUNOFF COEFFICIENT =	0.99	0.52	0.71

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 70.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTE CHN(0009) IN= 2---> OUT= 1	Routing time step (min)'= 5.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	414.20	0.0350	Main Channel
4.30	412.70	0.0350	Main Channel
8.60	414.20	0.0350	Main Channel

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	412.78	.456E+01	0.0	0.55	7.70
0.16	412.86	.182E+02	0.1	0.88	4.85
0.24	412.94	.410E+02	0.2	1.15	3.70
0.32	413.02	.729E+02	0.4	1.39	3.05
0.39	413.09	.114E+03	0.7	1.61	2.63
0.47	413.17	.164E+03	1.2	1.82	2.33
0.55	413.25	.223E+03	1.8	2.02	2.10
0.63	413.33	.292E+03	2.5	2.21	1.92
0.71	413.41	.369E+03	3.5	2.39	1.78
0.79	413.49	.456E+03	4.6	2.56	1.66
0.87	413.57	.551E+03	5.9	2.73	1.56
0.95	413.65	.656E+03	7.4	2.89	1.47
1.03	413.73	.770E+03	9.2	3.05	1.39
1.11	413.81	.893E+03	11.2	3.21	1.32
1.18	413.88	.103E+04	13.5	3.36	1.27
1.26	413.96	.117E+04	16.0	3.51	1.21
1.34	414.04	.132E+04	18.9	3.65	1.16
1.42	414.12	.148E+04	22.0	3.79	1.12
1.50	414.20	.165E+04	25.4	3.93	1.08

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (96211)	0.61	0.18	1.33	66.74	0.23	1.13
OUTFLOW: ID= 1 (0009)	0.61	0.17	1.42	66.71	0.23	1.11

ADD HYD (0147) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0149):	4.15	0.256	1.58	67.66
+ ID2= 2 (0627):	9.39	1.174	1.58	40.01
ID = 3 (0147):	13.54	1.430	1.58	48.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0147) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0147):	13.54	1.430	1.58	48.49
+ ID2= 2 (0009):	0.61	0.169	1.42	66.71
ID = 1 (0147):	14.15	1.551	1.58	49.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (9621) ID= 1 DT= 5.0 min	Area (ha)= 16.18 Total Imp(%)= 32.00 Dir. Conn.(%)= 20.00

	IMPERVIOUS	PERVIOUS (i)

```
     Surface Area     (ha)=       5.18        11.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     328.43        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        98.21
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.91 (ii)    9.89 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.25         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.56         2.06         3.170 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.42
     RUNOFF VOLUME    (mm)=      93.08        46.47         55.79
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.49          0.59

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8621)|   Area    (ha)=   4.69
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.69         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        75.38
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.73 (ii)    0.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.67         0.00         2.672 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      69.08        42.55         69.08
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.73         0.45          0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8623)|   Area    (ha)=   2.05
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.05         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       118.14
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.73 (ii)    0.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.17         0.00         1.168 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      69.08        62.38         69.08
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.73         0.66          0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  9623)|   Area    (ha)=   4.42
|ID= 1 DT= 5.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  35.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.12         2.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     171.66        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       108.17
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.65 (ii)    8.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.29         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.81         0.50         1.091 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      93.08        47.94         63.74
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.51          0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  8624)|   Area    (ha)=   4.32
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.32         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33        75.38
               over (min)        5.00         5.00
```

```
     Storage Coeff.  (min)=       0.73 (ii)    0.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                          *TOTALS*
     PEAK FLOW       (cms)=       2.46         0.00          2.461 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      69.08        42.55         69.08
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.73         0.45          0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9624)|   Area    (ha)=   8.46
|ID= 1 DT= 5.0 min |   Total Imp(%)=  51.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.31         4.15
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     237.49        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       104.69
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.22 (ii)    8.05 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.72         0.89          2.208 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      93.08        47.44         65.70
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.50          0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0628)|   Area    (ha)=   5.35
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.21         2.14
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     188.86        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       143.67
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.81 (ii)    8.91 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.28         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.12         0.61          1.456 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      93.08        52.30         68.61
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.56          0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8625)|   Area    (ha)=   4.11
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.11         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       118.14
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.73 (ii)    0.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                          *TOTALS*
     PEAK FLOW       (cms)=       2.34         0.00          2.342 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      69.08        62.38         69.08
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.73         0.66          0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9625)|   Area    (ha)=   8.07
|ID= 1 DT= 5.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  40.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.44         3.63
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     231.95        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       119.74
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.17 (ii)    7.84 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.64         0.89          2.147 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      93.08        49.49         66.93
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.53          0.71
```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 70.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (2621)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0628):	5.35	1.456	1.33	68.61
+ ID2= 2 (8621):	4.69	2.672	1.33	69.08
ID = 3 (2621):	10.04	4.128	1.33	68.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	10.04	4.128	1.33	68.83
+ ID2= 2 (8623):	2.05	1.168	1.33	69.08
ID = 1 (2621):	12.09	5.296	1.33	68.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2621):	12.09	5.296	1.33	68.87
+ ID2= 2 (8624):	4.32	2.461	1.33	69.08
ID = 3 (2621):	16.41	7.757	1.33	68.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	16.41	7.757	1.33	68.93
+ ID2= 2 (8625):	4.11	2.342	1.33	69.08
ID = 1 (2621):	20.52	10.099	1.33	68.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2621):	20.52	10.099	1.33	68.96
+ ID2= 2 (9621):	16.18	3.170	1.42	55.79
ID = 3 (2621):	36.70	12.757	1.33	63.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	36.70	12.757	1.33	63.16
+ ID2= 2 (9623):	4.42	1.091	1.33	63.74
ID = 1 (2621):	41.12	13.848	1.33	63.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2621):	41.12	13.848	1.33	63.22
+ ID2= 2 (9624):	8.46	2.208	1.33	65.70
ID = 3 (2621):	49.58	16.056	1.33	63.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (2621)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (2621):	49.58	16.056	1.33	63.64
+ ID2= 2 (9625):	8.07	2.147	1.33	66.93
ID = 1 (2621):	57.65	18.202	1.33	64.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(5621)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.5000	2.5000
	0.0010	0.0000	2.5000	3.0000
	0.0100	1.0000	3.0000	3.5000
	0.0500	1.5000	4.0000	4.0000
	0.5000	2.0000	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2621)	57.650	18.202	1.33	64.10
OUTFLOW: ID= 1 (5621)	57.650	1.915	2.33	52.02

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.52
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 2.7083

CALIB		
STANDHYD (9622)|	Area (ha)= 6.75	
ID= 1 DT= 5.0 min |	Total Imp(%)= 44.00	Dir. Conn.(%)= 30.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.97	3.78
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	212.13	30.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		205.33	108.17
over (min)		5.00	10.00
Storage Coeff. (min)=		3.01 (ii)	8.76 (ii)
Unit Hyd. Tpeak (min)=		5.00	10.00

```
     Unit Hyd. peak  (cms)=       0.28         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.04         0.81          1.559 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.42
     RUNOFF VOLUME    (mm)=      93.08        47.94          61.48
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.99         0.51           0.65

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8622)|   Area    (ha)=   2.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.99   Dir. Conn.(%)=  99.99
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.20         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       118.14
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.73 (ii)    0.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.25         0.00          1.253 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      69.08        62.38          69.08
     TOTAL RAINFALL   (mm)=      94.08        94.08          94.08
     RUNOFF COEFFICIENT   =       0.73         0.66           0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8622):     2.20   1.253     1.33    69.08
     + ID2= 2 (  9622):     6.75   1.559     1.42    61.48
       ================================================
       ID = 3 (  2622):     8.95   2.740     1.33    63.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  5622)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.4500      0.2500
                          0.0010      0.0000   |    0.6500      0.3200
                          0.0030      0.1200   |    0.8000      0.4000
                          0.1000      0.1500   |    0.9800      0.5000
                          0.3000      0.2000   |    0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2622)      8.950      2.740      1.33      63.35
   OUTFLOW: ID= 1 (  5622)      8.950      0.637      1.92      62.31

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.23
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3155

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2625)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  5621):    57.65   1.915     2.33    52.02
     + ID2= 2 (  5622):     8.95   0.637     1.92    62.31
       ================================================
       ID = 3 (  2625):    66.60   2.491     2.25    53.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0150)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0147):    14.15   1.551     1.58    49.27
     + ID2= 2 (  2625):    66.60   2.491     2.25    53.40
       ================================================
       ID = 3 (  0150):    80.75   3.226     1.92    52.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2620)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0150):    80.75   3.226     1.92    52.68
     + ID2= 2 (  2610):   652.20  26.703     2.97    45.59
       ================================================
       ID = 3 (  2620):   732.95  29.134     2.93    45.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.42   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   1.608

     PEAK FLOW       (cms)=   1.053 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  40.015
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.425

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.38
```

```
     Unit Hyd Qpeak  (cms)=   3.321

     PEAK FLOW       (cms)=   2.939 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  40.085
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.426

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <--------------------- TRAVEL TIME TABLE --------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0         0.17       47.72
       0.16   412.86    .357E+02       0.0         0.28       30.06
       0.24   412.94    .804E+02       0.1         0.36       22.94
       0.32   413.02    .143E+03       0.1         0.44       18.94
       0.39   413.09    .223E+03       0.2         0.51       16.32
       0.47   413.17    .322E+03       0.4         0.58       14.45
       0.55   413.25    .438E+03       0.6         0.64       13.04
       0.63   413.33    .572E+03       0.8         0.70       11.93
       0.71   413.41    .724E+03       1.1         0.76       11.03
       0.79   413.49    .893E+03       1.4         0.81       10.28
       0.87   413.57    .108E+04       1.9         0.86        9.65
       0.95   413.65    .129E+04       2.4         0.92        9.10
       1.03   413.73    .151E+04       2.9         0.97        8.63
       1.11   413.81    .175E+04       3.6         1.01        8.22
       1.18   413.88    .201E+04       4.3         1.06        7.85
       1.26   413.96    .229E+04       5.1         1.11        7.52
       1.34   414.04    .258E+04       6.0         1.15        7.22
       1.42   414.12    .289E+04       6.9         1.20        6.95
       1.50   414.20    .323E+04       8.0         1.24        6.70

                                 <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     2.94    1.83  40.08      1.03      0.97
   OUTFLOW: ID= 1 (  4630)   33.04     2.76    2.00  40.08      1.00      0.95


--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2620):   732.95  29.134     2.93    45.88
     + ID2= 2 (  4630):    33.04   2.762     2.00    40.08
       ====================================================
       ID = 3 (  2637):   765.99  30.165     2.87    45.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   765.99  30.165     2.87    45.63
     + ID2= 2 (  0637):     8.42   1.053     1.58    40.01
       ====================================================
       ID = 1 (  2637):   774.41  30.304     2.83    45.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.60   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.688

     PEAK FLOW       (cms)=   0.450 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  40.015
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.425

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   774.41  30.304     2.83    45.56
     + ID2= 2 (  0636):     3.60   0.450     1.58    40.01
       ====================================================
       ID = 3 (  2636):   778.01  30.365     2.83    45.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   3.940

     PEAK FLOW       (cms)=   2.580 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  40.015
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.425

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.47   Curve Number   (CN)= 70.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.854

     PEAK FLOW       (cms)=   0.559 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  40.015
     TOTAL RAINFALL   (mm)=  94.082
     RUNOFF COEFFICIENT   =   0.425

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
```

```
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   778.01  30.365     2.83    45.54
     + ID2= 2 (  0638):    20.63   2.580     1.58    40.01
       ================================================
       ID = 3 (  2630):   798.64  30.717     2.80    45.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   798.64  30.717     2.80    45.40
     + ID2= 2 (  0639):     4.47   0.559     1.58    40.01
       ================================================
       ID = 1 (  2630):   803.11  30.796     2.80    45.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  8709)|   Area    (ha)=   3.51
|ID= 1 DT= 5.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.51         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       118.14
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.73 (ii)    0.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.34
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.00         0.00         2.000 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      69.08        62.38         69.08
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.73         0.66          0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  9709)|   Area    (ha)=   7.20
|ID= 1 DT= 5.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  40.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.03         3.17
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     219.09        30.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     205.33       124.02
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.07 (ii)    7.69 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.27         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.47         0.81         1.937 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50          1.33
     RUNOFF VOLUME    (mm)=      93.08        50.03         67.25
     TOTAL RAINFALL   (mm)=      94.08        94.08         94.08
     RUNOFF COEFFICIENT   =       0.99         0.53          0.71

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2709)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8709):     3.51   2.000     1.33    69.08
     + ID2= 2 (  9709):     7.20   1.937     1.33    67.25
       ================================================
       ID = 3 (  2709):    10.71   3.937     1.33    67.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  5709)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000  |    0.6000      0.3800
                           0.0010      0.0000  |    0.9000      0.5400
                           0.0100      0.1000  |    1.1000      0.7100
                           0.0500      0.2000  |    1.4000      0.8900
                           0.4000      0.2400  |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  2709)     10.710      3.937      1.33      67.85
   OUTFLOW: ID= 1 (  5709)     10.710      0.688      2.00      67.85

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.48
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4277

--------------------------------------------------------------------------------

 FINISH
```

```
--------------------------------------------------------------------------------------------------------
----------
  ********************************************
  ** SIMULATION : Hazel                      **
  ********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\TNuman\AppD
|                  |              ata\Local\Temp\
|                  |              3d6695fb-a82e-4426-9b7a-6635f9e6cd56\910fba68
| Ptotal=212.00 mm |    Comments: Hazel
-------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    6.00 |  3.00   13.00 |  6.00   23.00 |  9.00   53.00
               1.00    4.00 |  4.00   17.00 |  7.00   13.00 | 10.00   38.00
               2.00    6.00 |  5.00   13.00 |  8.00   13.00 | 11.00   13.00
```

```
--------------------------------------------------------------------------------

-------------------
| CALIB           |
| NASHYD   (  0100)|   Area    (ha)= 136.98   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.17

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   4.464

     PEAK FLOW       (cms)=  13.246 (i)
     TIME TO PEAK    (hrs)=  11.300
     RUNOFF VOLUME    (mm)= 170.153
     TOTAL RAINFALL   (mm)= 211.999
     RUNOFF COEFFICIENT   =   0.803

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0201)|   Area    (ha)=  14.60   Curve Number   (CN)= 88.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.97

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.575

     PEAK FLOW       (cms)=   1.537 (i)
     TIME TO PEAK    (hrs)=  11.133
     RUNOFF VOLUME    (mm)= 180.756
     TOTAL RAINFALL   (mm)= 211.999
     RUNOFF COEFFICIENT   =   0.853

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0203)|   Area    (ha)=   8.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.69         4.51
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        70.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.36 (ii)    8.50 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.47         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.88         1.179 (iii)
     TIME TO PEAK    (hrs)=       9.40        10.00          10.00
     RUNOFF VOLUME    (mm)=     210.00       181.86         188.90
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       0.99         0.86           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2200)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0201):    14.60   1.537    11.13   180.76
     + ID2= 2 (  0203):     8.20   1.179    10.00   188.90
       ================================================
       ID = 3 (  2200):    22.80   2.381    11.00   183.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0205)|   Area    (ha)=   4.80   Curve Number   (CN)= 96.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.41

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.447

     PEAK FLOW       (cms)=   0.652 (i)
     TIME TO PEAK    (hrs)=  10.167
     RUNOFF VOLUME    (mm)= 200.421
     TOTAL RAINFALL   (mm)= 211.999
     RUNOFF COEFFICIENT   =   0.945

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0206)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        70.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.36 (ii)    8.50 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.47         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.02         0.029 (iii)
     TIME TO PEAK    (hrs)=       9.33        10.00          10.00
     RUNOFF VOLUME    (mm)=     210.00       181.86         188.87
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       0.99         0.86           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
```

```
--------------------
| ADD HYD  (  2201)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     4.80   0.652    10.17   200.42
     + ID2= 2 (  0206):     0.20   0.029    10.00   188.87
       ================================================
       ID = 3 (  2201):     5.00   0.677    10.13   199.96

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2201)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2201):     5.00   0.677    10.13   199.96
     + ID2= 2 (  2200):    22.80   2.381    11.00   183.68
       ================================================
       ID = 1 (  2201):    27.80   2.930    11.00   186.61

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   2.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       0.43         2.27
    Dep. Storage     (mm)=       2.00         5.00
    Average Slope     (%)=       1.20         1.20
    Length            (m)=      35.00        35.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.


    Max.Eff.Inten.(mm/hr)=      53.00        55.75
              over (min)        5.00        12.00
    Storage Coeff.  (min)=       1.66 (ii)   11.25 (ii)
    Unit Hyd. Tpeak (min)=       4.00        12.00
    Unit Hyd. peak  (cms)=       0.44         0.10
                                                      *TOTALS*
    PEAK FLOW       (cms)=       0.03         0.35         0.379 (iii)
    TIME TO PEAK    (hrs)=       9.43        10.00          10.00
    RUNOFF VOLUME    (mm)=     210.00       175.49         178.25
    TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
    RUNOFF COEFFICIENT   =       0.99         0.83           0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0207)|   Area    (ha)=   1.30
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       0.58         0.72
    Dep. Storage     (mm)=       2.00         5.00
    Average Slope     (%)=       1.20         1.20
    Length            (m)=      25.00        25.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Max.Eff.Inten.(mm/hr)=      53.00        70.29
              over (min)        5.00        10.00
    Storage Coeff.  (min)=       1.36 (ii)    8.50 (ii)
    Unit Hyd. Tpeak (min)=       4.00        10.00
    Unit Hyd. peak  (cms)=       0.47         0.13
                                                      *TOTALS*
    PEAK FLOW       (cms)=       0.05         0.14         0.187 (iii)
    TIME TO PEAK    (hrs)=       9.37        10.00          10.00
    RUNOFF VOLUME    (mm)=     210.00       181.86         188.89
    TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
    RUNOFF COEFFICIENT   =       0.99         0.86           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0207):     1.30   0.187    10.00   188.89
     + ID2= 2 (  0209):     2.70   0.379    10.00   178.25
       ================================================
       ID = 3 (  2202):     4.00   0.566    10.00   181.71

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2202)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2202):     4.00   0.566    10.00   181.71
     + ID2= 2 (  2201):    27.80   2.930    11.00   186.61
       ================================================
       ID = 1 (  2202):    31.80   3.457    10.00   185.99

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2100)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):   136.98  13.246    11.30   170.15
     + ID2= 2 (  2202):    31.80   3.457    10.00   185.99
       ================================================
       ID = 3 (  2100):   168.78  16.204    11.03   173.14

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0302)|   Area    (ha)=   2.90   Curve Number   (CN)= 88.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

    Unit Hyd Qpeak  (cms)=   0.246
```

```
     PEAK FLOW       (cms)=   0.372 (i)
     TIME TO PEAK    (hrs)=  10.200
     RUNOFF VOLUME    (mm)= 180.755
     TOTAL RAINFALL   (mm)= 211.999
     RUNOFF COEFFICIENT   =   0.853

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0304)|   Area    (ha)=   4.40
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.98         2.42
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        70.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.43 (ii)    8.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.46         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.47         0.632 (iii)
     TIME TO PEAK    (hrs)=       9.40        10.00        10.00
     RUNOFF VOLUME    (mm)=     210.00       181.86       188.89
     TOTAL RAINFALL   (mm)=     212.00       212.00       212.00
     RUNOFF COEFFICIENT   =       0.99         0.86         0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0302):     2.90   0.372    10.20   180.76
      + ID2= 2 (  0304):     4.40   0.632    10.00   188.89
        ========================================================
        ID = 3 (  2300):     7.30   0.987    10.00   185.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0308)|   Area    (ha)=   0.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.09         0.11
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        70.29
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.43 (ii)    8.98 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.46         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.02         0.029 (iii)
     TIME TO PEAK    (hrs)=       9.33        10.00        10.00
     RUNOFF VOLUME    (mm)=     210.00       181.86       188.87
     TOTAL RAINFALL   (mm)=     212.00       212.00       212.00
     RUNOFF COEFFICIENT   =       0.99         0.86         0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0310)|   Area    (ha)=   5.70
|ID= 1 DT= 2.0 min |   Total Imp(%)=  16.00   Dir. Conn.(%)=   8.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.91         4.79
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.20         1.20
     Length            (m)=      25.00        25.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        55.75
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.36 (ii)    9.20 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=       0.47         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.74         0.804 (iii)
     TIME TO PEAK    (hrs)=       9.37        10.00        10.00
     RUNOFF VOLUME    (mm)=     210.00       175.49       178.25
     TOTAL RAINFALL   (mm)=     212.00       212.00       212.00
     RUNOFF COEFFICIENT   =       0.99         0.83         0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  2301)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2300):     7.30   0.987    10.00   185.66
      + ID2= 2 (  0308):     0.20   0.029    10.00   188.87
        ========================================================
        ID = 3 (  2301):     7.50   1.016    10.00   185.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
```

```
| ADD HYD  (  2301)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2301):     7.50   1.016    10.00   185.75
     + ID2= 2 (  0310):     5.70   0.804    10.00   178.25
       ================================================
       ID = 1 (  2301):    13.20   1.821    10.00   182.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


------------------
| ADD HYD  (  2302)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2100):   168.78  16.204    11.03   173.14
     + ID2= 2 (  2301):    13.20   1.821    10.00   182.51
       ================================================
       ID = 3 (  2302):   181.98  17.576    11.00   173.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
| CALIB            |
| STANDHYD (  0400)|   Area    (ha)=  82.86
|ID= 1 DT= 2.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   3.00
------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       8.29        74.57
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       0.70         2.00
     Length            (m)=    1437.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        54.48
               over (min)        18.00        28.00
     Storage Coeff.  (min)=      18.14 (ii)   27.14 (ii)
     Unit Hyd. Tpeak (min)=      18.00        28.00
     Unit Hyd. peak  (cms)=       0.06         0.04
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.35         9.88        10.218 (iii)
     TIME TO PEAK    (hrs)=      10.03        10.23         10.23
     RUNOFF VOLUME    (mm)=     209.99       172.71        173.84
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       0.99         0.81          0.82

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
              YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

------------------
| ADD HYD  (  2400)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2302):   181.98  17.576    11.00   173.82
     + ID2= 2 (  0400):    82.86  10.218    10.23   173.84
       ================================================
       ID = 3 (  2400):   264.84  26.422    11.00   173.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
------------------
```

```
| ROUTE CHN(  4400)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 0.00         411.10        0.0550
                27.30         410.20        0.0550
                77.50         409.10        0.0550
                96.60         409.10        0.0550
               115.80         408.90        0.0550
               124.80         409.10        0.0550
               131.00         408.90    0.0550 /0.0350  Main Channel
               133.60         408.00        0.0350      Main Channel
               134.40         407.60        0.0350      Main Channel
               135.00         407.50        0.0350      Main Channel
               135.80         407.60        0.0350      Main Channel
               136.50         408.00        0.0350      Main Channel
               139.40         408.80    0.0350 /0.0550  Main Channel
               143.50         408.90        0.0550
               148.50         408.70        0.0550
               163.80         408.90        0.0550
               183.20         408.90        0.0550
               243.70         409.70        0.0550
               278.70         410.20        0.0550
               330.50         411.40        0.0550

    <-------------------- TRAVEL TIME TABLE ---------------------->
     DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
      (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
     0.19   407.69    .366E+03       0.1         0.51       58.83
     0.37   407.87    .106E+04       0.5         0.81       37.08
     0.56   408.06    .199E+04       1.1         1.00       29.93
     0.74   408.24    .328E+04       2.1         1.14       26.32
     0.93   408.43    .498E+04       3.6         1.28       23.32
     1.11   408.61    .708E+04       5.6         1.43       20.94
     1.30   408.80    .105E+05       8.5         1.45       20.61
     1.49   408.99    .247E+05      14.8         1.07       27.91
     1.68   409.18    .601E+05      30.4         0.91       32.97
     1.87   409.37    .109E+06      58.5         0.96       31.05
     2.06   409.56    .166E+06      98.3         1.06       28.11
     2.25   409.75    .231E+06     150.3         1.17       25.57
     2.44   409.94    .303E+06     215.4         1.28       23.46
     2.64   410.14    .383E+06     293.8         1.38       21.74
     2.83   410.33    .470E+06     390.1         1.49       20.10
     3.02   410.52    .563E+06     502.4         1.60       18.66
     3.21   410.71    .660E+06     628.8         1.71       17.48
     3.40   410.90    .762E+06     769.5         1.81       16.49
     3.59   411.09    .868E+06     924.9         1.91       15.65

                                <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  2400)  264.84    26.42   11.00 173.82      1.63      0.94
  OUTFLOW: ID= 1 (  4400)  264.84    24.70   11.33 173.82      1.61      0.96


--------------------------------------------------------------------------------
------------------
| CALIB            |
| NASHYD   (  0515)|   Area    (ha)=   5.01   Curve Number   (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
------------------   U.H. Tp(hrs)=   0.41

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


    Unit Hyd Qpeak  (cms)=   0.467

    PEAK FLOW       (cms)=   0.616 (i)
    TIME TO PEAK    (hrs)=  10.167
```

```
     RUNOFF VOLUME    (mm)= 161.698
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.763

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0510)|   Area    (ha)=  91.44   Curve Number   (CN)= 86.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.09

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Unit Hyd Qpeak  (cms)=   3.204

     PEAK FLOW       (cms)=   9.158 (i)
     TIME TO PEAK    (hrs)=  11.250
     RUNOFF VOLUME    (mm)= 175.940
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.830

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4510)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  5.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00        414.20        0.0350      Main Channel
                   4.30        412.70        0.0350      Main Channel
                   8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   412.78    .206E+02       0.0          0.19     101.61
        0.16   412.86    .822E+02       0.0          0.30      64.01
        0.24   412.94    .185E+03       0.1          0.39      48.85
        0.32   413.02    .329E+03       0.1          0.48      40.33
        0.39   413.09    .514E+03       0.2          0.55      34.75
        0.47   413.17    .740E+03       0.4          0.62      30.77
        0.55   413.25    .101E+04       0.6          0.69      27.77
        0.63   413.33    .132E+04       0.9          0.75      25.40
        0.71   413.41    .166E+04       1.2          0.82      23.48
        0.79   413.49    .206E+04       1.6          0.88      21.89
        0.87   413.57    .249E+04       2.0          0.93      20.54
        0.95   413.65    .296E+04       2.5          0.99      19.39
        1.03   413.73    .347E+04       3.1          1.04      18.38
        1.11   413.81    .403E+04       3.8          1.10      17.49
        1.18   413.88    .462E+04       4.6          1.15      16.71
        1.26   413.96    .526E+04       5.5          1.20      16.00
        1.34   414.04    .594E+04       6.4          1.25      15.37
        1.42   414.12    .666E+04       7.5          1.30      14.79
        1.50   414.20    .742E+04       8.7          1.34      14.27

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0510)   91.44     9.16   11.25 175.94      1.50      1.34
   OUTFLOW: ID= 1 (  4510)   91.44     9.02   11.42 175.93      1.50      1.34



--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0517)|   Area    (ha)=   2.14   Curve Number   (CN)= 86.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   1.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.32

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

     Unit Hyd Qpeak  (cms)=   0.255

     PEAK FLOW       (cms)=   0.289 (i)
     TIME TO PEAK    (hrs)=  10.083
     RUNOFF VOLUME    (mm)= 175.887
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.830

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0511)|   Area    (ha)=  52.87
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      26.43        26.43
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     593.69        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
     Max.Eff.Inten.(mm/hr)=      53.00        72.31
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       9.59 (ii)   19.48 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.11         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       2.33         4.99          7.311 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.08         10.00
     RUNOFF VOLUME    (mm)=     211.20       185.02        192.87
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       1.00         0.87          0.91


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0516)|   Area    (ha)=  10.78
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
-------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.85         5.93
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     268.08        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


     Max.Eff.Inten.(mm/hr)=      53.00        50.59
               over (min)         5.00        20.00
     Storage Coeff.  (min)=       5.95 (ii)   17.36 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
```

```
     Unit Hyd. peak  (cms)=       0.19         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.71         0.79          1.506 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.00         10.00
     RUNOFF VOLUME    (mm)=     211.20       175.94        191.81
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       1.00         0.83          0.90


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2511)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0511):    52.87   7.311    10.00   192.87
     + ID2= 2 (  0516):    10.78   1.506    10.00   191.81
       ================================================
       ID = 3 (  2511):    63.65   8.818    10.00   192.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2511):    63.65   8.818    10.00   192.69
     + ID2= 2 (  4510):    91.44   9.022    11.42   175.93
       ================================================
       ID = 3 (  2510):   155.09  15.328    11.00   182.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2510)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2510):   155.09  15.328    11.00   182.81
     + ID2= 2 (  0517):     2.14   0.289    10.08   175.89
       ================================================
       ID = 1 (  2510):   157.23  15.550    11.00   182.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0512)|   Area    (ha)=  27.13
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  30.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.56        13.56
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     425.28        40.00
     Mannings n            =     0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        72.31
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       7.85 (ii)   15.88 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.13         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.20         2.62          3.821 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.00         10.00
     RUNOFF VOLUME    (mm)=     211.20       185.02        192.87
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       1.00         0.87          0.91


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0513)|   Area    (ha)=   6.44
|ID= 1 DT= 5.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  35.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19         2.25
     Dep. Storage     (mm)=       0.80         1.50
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     207.20        40.00
     Mannings n            =     0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        96.89
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       5.10 (ii)   13.90 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.21         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.33         0.60          0.927 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.00         10.00
     RUNOFF VOLUME    (mm)=     211.20       191.05        198.10
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       1.00         0.90          0.93


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD    (  8512)|
| Inlet Cap.= 0.732|
| #of Inlets=     1|
| Total(cms)=   0.7|      AREA     QPEAK     TPEAK    R.V.
-------------------          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   6.44      0.93     10.00  198.10
     ================================================
     MAJOR SYS.(ID= 2):   0.23      0.20     10.00  198.10
     MINOR SYS.(ID= 3):   6.21      0.73      9.33  198.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2512)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0512):    27.13   3.821    10.00   192.87
```

```
      + ID2= 2 (  8512):     6.21   0.732     9.33   198.10
        ================================================
        ID = 3 (  2512):    33.34   4.553    10.00   193.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2514)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2510):   157.23  15.550    11.00   182.72
      + ID2= 2 (  2512):    33.34   4.553    10.00   193.85
        ================================================
        ID = 3 (  2514):   190.57  19.083    11.00   184.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2514)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2514):   190.57  19.083    11.00   184.67
      + ID2= 2 (  0515):     5.01   0.616    10.17   161.70
        ================================================
        ID = 1 (  2514):   195.58  19.594    11.00   184.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0518)|   Area    (ha)=   6.68   Curve Number   (CN)= 86.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Unit Hyd Qpeak  (cms)=   1.276

     PEAK FLOW       (cms)=   0.930 (i)
     TIME TO PEAK    (hrs)=  10.000
     RUNOFF VOLUME    (mm)= 172.207
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.812

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2513)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2514):   195.58  19.594    11.00   184.08
      + ID2= 2 (  4400):   264.84  24.698    11.33   173.82
        ================================================
        ID = 3 (  2513):   460.42  43.555    11.00   178.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2513)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  2513):   460.42  43.555    11.00   178.18
      + ID2= 2 (  0518):     6.68   0.930    10.00   172.21
        ================================================
        ID = 1 (  2513):   467.10  44.235    11.00   178.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0520)|   Area    (ha)= 108.36   Curve Number   (CN)= 86.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.20

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.



     Unit Hyd Qpeak  (cms)=   3.449

     PEAK FLOW       (cms)=  10.463 (i)
     TIME TO PEAK    (hrs)=  11.333
     RUNOFF VOLUME    (mm)= 172.534
     TOTAL RAINFALL   (mm)= 211.999
     RUNOFF COEFFICIENT   =   0.814

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2520)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  2513):   467.10  44.235    11.00   178.09
      + ID2= 2 (  0520):   108.36  10.463    11.33   172.53
        ================================================
        ID = 3 (  2520):   575.46  54.354    11.00   177.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  4500)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00         409.70        0.0550
                 19.70         408.80        0.0550
                 41.70         407.20        0.0550
                 60.50         405.30        0.0550
                 80.00         404.50        0.0550
                 95.70         404.60    0.0550 /0.0350  Main Channel
                 98.60         403.40        0.0350      Main Channel
                100.40         403.40        0.0350      Main Channel
                100.80         402.90        0.0350      Main Channel
                101.50         402.70        0.0350      Main Channel
                102.30         402.80        0.0350      Main Channel
                103.30         403.20        0.0350      Main Channel
                104.00         403.20        0.0350      Main Channel
                105.60         404.40    0.0350 /0.0550  Main Channel
                109.70         404.30        0.0550
                128.60         404.20        0.0550
                154.10         405.40        0.0550
                179.10         406.70        0.0550
                201.90         408.60        0.0550
                224.20         410.60        0.0550

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.34   403.04    .954E+03       0.3          0.70      47.40
      0.68   403.38    .304E+04       1.6          1.03      32.27
      1.02   403.72    .718E+04       4.5          1.25      26.57
      1.36   404.06    .122E+05       9.7          1.58      20.96
```

```
      1.70   404.40    .251E+05      18.1          1.44      23.04
      2.08   404.78    .650E+05      42.3          1.29      25.62
      2.46   405.16    .122E+06      86.3          1.40      23.62
      2.84   405.54    .192E+06     151.6          1.57      21.10
      3.21   405.91    .270E+06     238.3          1.75      18.90
      3.59   406.29    .357E+06     345.8          1.93      17.20
      3.97   406.67    .452E+06     474.9          2.09      15.85
      4.35   407.05    .554E+06     631.1          2.26      14.63
      4.73   407.43    .663E+06     807.8          2.42      13.67
      5.11   407.81    .779E+06    1006.4          2.57      12.89
      5.49   408.19    .902E+06    1229.0          2.71      12.23
      5.86   408.56    .103E+07    1476.4          2.84      11.66
      6.24   408.94    .117E+07    1745.6          2.96      11.18
      6.62   409.32    .132E+07    2034.5          3.07      10.79
      7.00   409.70    .147E+07    2353.2          3.17      10.44

                                <---- hydrograph ---->   <-pipe / channel->
                          AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                          (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  2520) 575.46    54.35   11.00 177.05      2.18      1.32
  OUTFLOW: ID= 1 (  4500) 575.46    51.49   11.30 177.04      2.16      1.31


--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0610)|   Area    (ha)=  78.05   Curve Number   (CN)= 86.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   1.00

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.


     Unit Hyd Qpeak  (cms)=   2.981

     PEAK FLOW       (cms)=   8.022 (i)
     TIME TO PEAK    (hrs)=  11.167
     RUNOFF VOLUME    (mm)= 172.534
     TOTAL RAINFALL   (mm)= 211.999
     RUNOFF COEFFICIENT   =   0.814

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2610)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  4500):   575.46  51.492    11.30   177.04
     + ID2= 2 (  0610):    78.05   8.022    11.17   172.53
       ================================================
       ID = 3 (  2610):   653.51  59.472    11.27   176.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0627)|   Area    (ha)=   9.39   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Unit Hyd Qpeak  (cms)=   1.793

     PEAK FLOW       (cms)=   1.298 (i)
     TIME TO PEAK    (hrs)=  10.000
     RUNOFF VOLUME    (mm)= 169.831
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.801

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6240)|   Area    (ha)=   0.79
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  70.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.71         0.08
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


     Max.Eff.Inten.(mm/hr)=      53.00       158.23
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.02 (ii)    3.77 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.25
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.03         0.116 (iii)
     TIME TO PEAK    (hrs)=       9.33        10.00         10.00
     RUNOFF VOLUME    (mm)=     211.48       198.67        207.64
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       1.00         0.94          0.98

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  88.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  6210)|   Area    (ha)=   1.96
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  40.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.18         0.78
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        78.11
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.54 (ii)    9.33 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.17         0.285 (iii)
     TIME TO PEAK    (hrs)=       9.50        10.00         10.00
     RUNOFF VOLUME    (mm)=     211.48       186.45        196.46
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       1.00         0.88          0.93
```

```
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  88.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  ( 26240)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  6210):     1.96   0.285    10.00   196.46
      + ID2= 2 (  6240):     0.79   0.116    10.00   207.64
        =====================================================
        ID = 3 ( 26240):     2.75   0.401    10.00   199.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  6220)|   Area    (ha)=   0.92
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  20.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.37         0.55
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      40.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        69.15
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.54 (ii)    9.72 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.11         0.133 (iii)
     TIME TO PEAK    (hrs)=       9.42        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.48       183.55         189.13
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.87           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  88.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  6230)|   Area    (ha)=   0.48
|ID= 1 DT= 5.0 min |   Total Imp(%)=  10.00   Dir. Conn.(%)=   5.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.05         0.43
     Dep. Storage     (mm)=       0.52         7.16
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      20.00        20.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        54.14
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.02 (ii)    6.97 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.00         0.06          0.068 (iii)
     TIME TO PEAK    (hrs)=       9.25        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.48       176.93         178.64
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.83           0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
             YOU SHOULD CONSIDER SPLITTING THE AREA.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  88.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 ( 26240):     2.75   0.401    10.00   199.67
      + ID2= 2 (  6220):     0.92   0.133    10.00   189.13
        =====================================================
        ID = 3 (  0004):     3.67   0.534    10.00   197.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):     3.67   0.534    10.00   197.03
      + ID2= 2 (  6230):     0.48   0.068    10.00   178.64
        =====================================================
        ID = 1 (  0004):     4.15   0.602    10.00   194.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  4620)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  0.00         414.20        0.0350      Main Channel
                  4.30         412.70        0.0350      Main Channel
                  8.60         414.20        0.0350      Main Channel

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
       (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
      0.08   412.78    .456E+01       0.0          0.55       7.70
      0.16   412.86    .182E+02       0.1          0.88       4.85
      0.24   412.94    .410E+02       0.2          1.15       3.70
      0.32   413.02    .729E+02       0.4          1.39       3.05
      0.39   413.09    .114E+03       0.7          1.61       2.63
      0.47   413.17    .164E+03       1.2          1.82       2.33
      0.55   413.25    .223E+03       1.8          2.02       2.10
      0.63   413.33    .292E+03       2.5          2.21       1.92
```

```
       0.71   413.41    .369E+03       3.5          2.39       1.78
       0.79   413.49    .456E+03       4.6          2.56       1.66
       0.87   413.57    .551E+03       5.9          2.73       1.56
       0.95   413.65    .656E+03       7.4          2.89       1.47
       1.03   413.73    .770E+03       9.2          3.05       1.39
       1.11   413.81    .893E+03      11.2          3.21       1.32
       1.18   413.88    .103E+04      13.5          3.36       1.27
       1.26   413.96    .117E+04      16.0          3.51       1.21
       1.34   414.04    .132E+04      18.9          3.65       1.16
       1.42   414.12    .148E+04      22.0          3.79       1.12
       1.50   414.20    .165E+04      25.4          3.93       1.08

                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0004)    4.15     0.60   10.00 194.90      0.37      1.52
   OUTFLOW: ID= 1 (  4620)    4.15     0.60   10.00 194.89      0.36      1.52



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8623)|   Area    (ha)=   2.05
|ID= 1 DT= 2.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.05         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        50.33
               over (min)        5.00         2.00
     Storage Coeff.  (min)=       1.25 (ii)    1.34 (ii)
     Unit Hyd. Tpeak (min)=       4.00         2.00
     Unit Hyd. peak  (cms)=       0.48         0.66
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.00          0.302 (iii)
     TIME TO PEAK    (hrs)=       9.37        10.00          9.97
     RUNOFF VOLUME    (mm)=     187.00       173.54        187.00
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       0.88         0.82          0.88

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8621)|   Area    (ha)=   4.69
|ID= 1 DT= 2.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.69         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        50.33
               over (min)        5.00         2.00
     Storage Coeff.  (min)=       1.25 (ii)    1.34 (ii)
     Unit Hyd. Tpeak (min)=       4.00         2.00
     Unit Hyd. peak  (cms)=       0.48         0.66
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.69         0.00          0.690 (iii)
     TIME TO PEAK    (hrs)=       9.37        10.00          9.97
     RUNOFF VOLUME    (mm)=     187.00       173.54        187.00
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       0.88         0.82          0.88

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  8624)|   Area    (ha)=   4.32
|ID= 1 DT= 2.0 min |   Total Imp(%)= 100.00   Dir. Conn.(%)= 100.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.32         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        50.33
               over (min)        5.00         2.00
     Storage Coeff.  (min)=       1.25 (ii)    1.34 (ii)
     Unit Hyd. Tpeak (min)=       4.00         2.00
     Unit Hyd. peak  (cms)=       0.48         0.66
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.64         0.00          0.636 (iii)
     TIME TO PEAK    (hrs)=       9.40        10.00          9.97
     RUNOFF VOLUME    (mm)=     187.00       173.54        187.00
     TOTAL RAINFALL   (mm)=     212.00       212.00        212.00
     RUNOFF COEFFICIENT   =       0.88         0.82          0.88

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  9621)|   Area    (ha)=  16.18
|ID= 1 DT= 5.0 min |   Total Imp(%)=  32.00   Dir. Conn.(%)=  20.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.18        11.00
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     328.43        30.00
     Mannings n            =      0.013        0.250
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

Max.Eff.Inten.(mm/hr)=	53.00	59.86		
over (min)	5.00	15.00		
Storage Coeff. (min)=	6.72 (ii)	14.01 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.18	0.08		
			TOTALS	
PEAK FLOW (cms)=	0.48	1.79	2.264 (iii)	
TIME TO PEAK (hrs)=	10.00	10.00	10.00	
RUNOFF VOLUME (mm)=	211.00	175.55	182.64	
TOTAL RAINFALL (mm)=	212.00	212.00	212.00	
RUNOFF COEFFICIENT =	1.00	0.83	0.86	

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (8625)	Area (ha)= 4.11
ID= 1 DT= 2.0 min	Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.11	0.00
Dep. Storage (mm)=	25.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	20.00	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

Max.Eff.Inten.(mm/hr)=	53.00	50.33		
over (min)	5.00	2.00		
Storage Coeff. (min)=	1.25 (ii)	1.34 (ii)		
Unit Hyd. Tpeak (min)=	4.00	2.00		
Unit Hyd. peak (cms)=	0.48	0.66		
			TOTALS	
PEAK FLOW (cms)=	0.61	0.00	0.605 (iii)	
TIME TO PEAK (hrs)=	9.37	10.00	9.97	
RUNOFF VOLUME (mm)=	187.00	173.54	186.99	
TOTAL RAINFALL (mm)=	212.00	212.00	212.00	
RUNOFF COEFFICIENT =	0.88	0.82	0.88	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (9625)	Area (ha)= 8.07
ID= 1 DT= 5.0 min	Total Imp(%)= 55.00 Dir. Conn.(%)= 40.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.44	3.63
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	231.95	30.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

Max.Eff.Inten.(mm/hr)=	53.00	68.37		
over (min)	5.00	15.00		
Storage Coeff. (min)=	5.46 (ii)	12.37 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.20	0.08		
			TOTALS	
PEAK FLOW (cms)=	0.48	0.68	1.155 (iii)	
TIME TO PEAK (hrs)=	10.00	10.00	10.00	
RUNOFF VOLUME (mm)=	211.00	179.30	191.98	
TOTAL RAINFALL (mm)=	212.00	212.00	212.00	
RUNOFF COEFFICIENT =	1.00	0.85	0.91	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0628)	Area (ha)= 5.35
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 40.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.21	2.14
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	188.86	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

Max.Eff.Inten.(mm/hr)=	53.00	77.38		
over (min)	5.00	15.00		
Storage Coeff. (min)=	4.82 (ii)	12.64 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.22	0.08		
			TOTALS	
PEAK FLOW (cms)=	0.32	0.45	0.768 (iii)	
TIME TO PEAK (hrs)=	10.00	10.00	10.00	
RUNOFF VOLUME (mm)=	211.00	182.53	193.92	
TOTAL RAINFALL (mm)=	212.00	212.00	212.00	
RUNOFF COEFFICIENT =	1.00	0.86	0.91	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (9624)	Area (ha)= 8.46
ID= 1 DT= 5.0 min	Total Imp(%)= 51.00 Dir. Conn.(%)= 40.00

	IMPERVIOUS	PERVIOUS (i)

```
     Surface Area     (ha)=       4.31         4.15
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     237.49        30.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        62.46
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       5.53 (ii)   12.70 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.20         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.50         0.71         1.205 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.00       176.79         190.47
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.83           0.90


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD (  9623)|   Area    (ha)=   4.42
|ID= 1 DT= 5.0 min |   Total Imp(%)=  48.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.12         2.30
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     171.66        30.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        63.85
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       4.55 (ii)   11.66 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.23         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.40         0.630 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.00       177.41         189.17
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.84           0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0628):     5.35   0.768    10.00   193.92
     + ID2= 2 (  8621):     4.69   0.690     9.97   187.00
       ================================================
       ID = 3 (  2621):    10.04   1.459    10.00   190.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    10.04   1.459    10.00   190.68
     + ID2= 2 (  8623):     2.05   0.302     9.97   187.00
       ================================================
       ID = 1 (  2621):    12.09   1.760    10.00   190.06

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    12.09   1.760    10.00   190.06
     + ID2= 2 (  8624):     4.32   0.636     9.97   187.00
       ================================================
       ID = 3 (  2621):    16.41   2.396    10.00   189.25

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    16.41   2.396    10.00   189.25
     + ID2= 2 (  8625):     4.11   0.605     9.97   186.99
       ================================================
       ID = 1 (  2621):    20.52   3.001    10.00   188.80

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    20.52   3.001    10.00   188.80
     + ID2= 2 (  9621):    16.18   2.264    10.00   182.64
       ================================================
       ID = 3 (  2621):    36.70   5.265    10.00   186.08

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    36.70   5.265    10.00   186.08
     + ID2= 2 (  9623):     4.42   0.630    10.00   189.17
       ================================================
       ID = 1 (  2621):    41.12   5.895    10.00   186.42

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
```

```
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    41.12   5.895    10.00   186.42
     + ID2= 2 (  9624):     8.46   1.205    10.00   190.47
       ================================================
       ID = 3 (  2621):    49.58   7.101    10.00   187.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2621)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2621):    49.58   7.101    10.00   187.11
     + ID2= 2 (  9625):     8.07   1.155    10.00   191.98
       ================================================
       ID = 1 (  2621):    57.65   8.256    10.00   187.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  9622)|   Area    (ha)=   6.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  44.00   Dir. Conn.(%)=  30.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.97         3.78
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     212.13        30.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        63.85
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       5.17 (ii)   12.28 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.21         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.66          0.959 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.00       177.41         187.49
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.84           0.88


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  8622)|   Area    (ha)=   2.20
|ID= 1 DT= 2.0 min |   Total Imp(%)=  99.99   Dir. Conn.(%)=  99.99
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.20         0.00
     Dep. Storage     (mm)=      25.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      20.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.

     Max.Eff.Inten.(mm/hr)=      53.00        50.33
               over (min)        5.00         2.00
     Storage Coeff.  (min)=       1.25 (ii)    1.48 (ii)
     Unit Hyd. Tpeak (min)=       4.00         2.00
     Unit Hyd. peak  (cms)=       0.48         0.63
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.00          0.324 (iii)
     TIME TO PEAK    (hrs)=       9.37        10.00           9.97
     RUNOFF VOLUME    (mm)=     187.00       173.54         187.00
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       0.88         0.82           0.88

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2622)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  8622):     2.20   0.324     9.97   187.00
     + ID2= 2 (  9622):     6.75   0.959    10.00   187.49
       ================================================
       ID = 3 (  2622):     8.95   1.282    10.00   187.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0118)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2621):    57.65   8.256    10.00   187.79
     + ID2= 2 (  2622):     8.95   1.282    10.00   187.37
       ================================================
       ID = 3 (  0118):    66.60   9.538    10.00   187.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD ( 96211)|   Area    (ha)=   0.61
|ID= 1 DT= 2.0 min |   Total Imp(%)=  58.00   Dir. Conn.(%)=  40.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.35         0.26
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      63.77        30.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.



     Max.Eff.Inten.(mm/hr)=      53.00        73.52
               over (min)        5.00        12.00
     Storage Coeff.  (min)=       2.51 (ii)   10.32 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=       0.37         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.05          0.088 (iii)
     TIME TO PEAK    (hrs)=       9.60        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.00       181.23         193.13
```

```
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.85           0.91


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  85.0     Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
-------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <-------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .456E+01       0.0         0.55        7.70
       0.16   412.86    .182E+02       0.1         0.88        4.85
       0.24   412.94    .410E+02       0.2         1.15        3.70
       0.32   413.02    .729E+02       0.4         1.39        3.05
       0.39   413.09    .114E+03       0.7         1.61        2.63
       0.47   413.17    .164E+03       1.2         1.82        2.33
       0.55   413.25    .223E+03       1.8         2.02        2.10
       0.63   413.33    .292E+03       2.5         2.21        1.92
       0.71   413.41    .369E+03       3.5         2.39        1.78
       0.79   413.49    .456E+03       4.6         2.56        1.66
       0.87   413.57    .551E+03       5.9         2.73        1.56
       0.95   413.65    .656E+03       7.4         2.89        1.47
       1.03   413.73    .770E+03       9.2         3.05        1.39
       1.11   413.81    .893E+03      11.2         3.21        1.32
       1.18   413.88    .103E+04      13.5         3.36        1.27
       1.26   413.96    .117E+04      16.0         3.51        1.21
       1.34   414.04    .132E+04      18.9         3.65        1.16
       1.42   414.12    .148E+04      22.0         3.79        1.12
       1.50   414.20    .165E+04      25.4         3.93        1.08

                                 <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 ( 96211)    0.61     0.09   10.00 193.13      0.17      0.92
  OUTFLOW: ID= 1 (  0009)    0.61     0.09   10.00 193.10      0.17      0.92



--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0117)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0118):    66.60   9.538    10.00   187.73
     + ID2= 2 (  4620):     4.15   0.602    10.00   194.89
       ==========================================================
       ID = 3 (  0117):    70.75   9.684    10.00   190.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0117)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0117):    70.75   9.684    10.00   190.44
     + ID2= 2 (  0627):     9.39   1.298    10.00   169.83
       ==========================================================
       ID = 1 (  0117):    80.14  10.982    10.00   188.02

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0117)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0117):    80.14  10.982    10.00   188.02
     + ID2= 2 (  0009):     0.61   0.088    10.00   193.10
       ==========================================================
       ID = 3 (  0117):    80.75  11.069    10.00   188.06

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0116)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0117):    80.75  11.069    10.00   188.06
     + ID2= 2 (  2610):   653.51  59.472    11.27   176.51
       ==========================================================
       ID = 3 (  0116):   734.26  66.283    11.00   177.78

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0637)|   Area    (ha)=   8.36   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.47

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.



    Unit Hyd Qpeak  (cms)=   0.679

    PEAK FLOW       (cms)=   1.035 (i)
    TIME TO PEAK    (hrs)=  10.250
    RUNOFF VOLUME    (mm)= 170.144
    TOTAL RAINFALL   (mm)= 212.000
    RUNOFF COEFFICIENT   =   0.803

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0630)|   Area    (ha)=  33.04   Curve Number   (CN)= 85.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.38

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.



    Unit Hyd Qpeak  (cms)=   3.321

    PEAK FLOW       (cms)=   4.294 (i)
    TIME TO PEAK    (hrs)=  10.133
    RUNOFF VOLUME    (mm)= 170.152
    TOTAL RAINFALL   (mm)= 211.999
    RUNOFF COEFFICIENT   =   0.803

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ROUTE CHN(  4630)|
| IN= 2---> OUT= 1 |     Routing time step (min)'=  2.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                  0.00        414.20        0.0350      Main Channel
                  4.30        412.70        0.0350      Main Channel
                  8.60        414.20        0.0350      Main Channel

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.08   412.78    .893E+01       0.0          0.17      47.72
       0.16   412.86    .357E+02       0.0          0.28      30.06
       0.24   412.94    .804E+02       0.1          0.36      22.94
       0.32   413.02    .143E+03       0.1          0.44      18.94
       0.39   413.09    .223E+03       0.2          0.51      16.32
       0.47   413.17    .322E+03       0.4          0.58      14.45
       0.55   413.25    .438E+03       0.6          0.64      13.04
       0.63   413.33    .572E+03       0.8          0.70      11.93
       0.71   413.41    .724E+03       1.1          0.76      11.03
       0.79   413.49    .893E+03       1.4          0.81      10.28
       0.87   413.57    .108E+04       1.9          0.86       9.65
       0.95   413.65    .129E+04       2.4          0.92       9.10
       1.03   413.73    .151E+04       2.9          0.97       8.63
       1.11   413.81    .175E+04       3.6          1.01       8.22
       1.18   413.88    .201E+04       4.3          1.06       7.85
       1.26   413.96    .229E+04       5.1          1.11       7.52
       1.34   414.04    .258E+04       6.0          1.15       7.22
       1.42   414.12    .289E+04       6.9          1.20       6.95
       1.50   414.20    .323E+04       8.0          1.24       6.70

                                <---- hydrograph ---->   <-pipe / channel->
                                 AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                 (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0630)   33.04     4.29   10.13 170.15      1.19      1.06
   OUTFLOW: ID= 1 (  4630)   33.04     4.22   10.23 170.14      1.18      1.06



--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0116):   734.26  66.283    11.00   177.78
     + ID2= 2 (  4630):    33.04   4.224    10.23   170.14
       ====================================================
       ID = 3 (  2637):   767.30  69.804    11.00   177.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2637)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2637):   767.30  69.804    11.00   177.45
     + ID2= 2 (  0637):     8.36   1.035    10.25   170.14
       ====================================================
       ID = 1 (  2637):   775.66  70.699    11.00   177.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0636)|   Area    (ha)=   3.32   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


     Unit Hyd Qpeak  (cms)=   0.264

     PEAK FLOW       (cms)=   0.409 (i)
     TIME TO PEAK    (hrs)=  10.250
     RUNOFF VOLUME    (mm)= 170.145
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.803

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  2636)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2637):   775.66  70.699    11.00   177.37
     + ID2= 2 (  0636):     3.32   0.409    10.25   170.14
       ====================================================
       ID = 3 (  2636):   778.98  71.055    11.00   177.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0638)|   Area    (ha)=  20.63   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


     Unit Hyd Qpeak  (cms)=   1.713

     PEAK FLOW       (cms)=   2.567 (i)
     TIME TO PEAK    (hrs)=  10.167
     RUNOFF VOLUME    (mm)= 170.143
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.803

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0639)|   Area    (ha)=   4.60   Curve Number   (CN)= 85.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


     Unit Hyd Qpeak  (cms)=   0.409

     PEAK FLOW       (cms)=   0.582 (i)
     TIME TO PEAK    (hrs)=  10.167
     RUNOFF VOLUME    (mm)= 170.139
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.803

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
```

```
| ADD HYD  (  2630)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  2636):   778.98  71.055    11.00   177.34
     + ID2= 2 (  0638):    20.63   2.567    10.17   170.14
       ================================================
       ID = 3 (  2630):   799.61  73.257    11.00   177.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  2630)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  2630):   799.61  73.257    11.00   177.15
     + ID2= 2 (  0639):     4.60   0.582    10.17   170.14
       ================================================
       ID = 1 (  2630):   804.21  73.744    11.00   177.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH
================================================================================================
==========
```

Drawings

P:\P\49878\100\49878-100-EC2

MTE FILE PATH:

March 5, 2025 – 4:24:10 PM – Plotted By: Fahim Gangat

WOOLWICH STREET EAST

SIDEROAD 15

GERRIE ROAD

IRVINE STREET

CLEGG ROAD

BRICKER AVENUE

STUMPF STREET

MARR DRIVE

WALSER STREET

QUEEN STREET CREEK

NICHOL DRAIN No.1

SALEM PUBLIC SCHOOL

EXISTING RESIDENTIAL

CLAYTON SUBDIVISION

ELORA MEADOWS

ELORA SANDS

KEATING LANDS

AINLEY FARM SUBDIVISION

APPROXIMATE FLOODPLAIN (FROM NICHOL DRAIN SUBWATERSHED STUDY PHASE 1 EXISTING CONDITIONS FINAL REPORT)

APPROXIMATE FLOODPLAIN (FROM NICHOL DRAIN SUBWATERSHED STUDY PHASE 1 EXISTING CONDITIONS FINAL REPORT)

10m WOODLAND BUFFER (SEASON)

WOODLAND LIMIT (SEASON)

LEGEND

- PROPERTY BOUNDARY
- SUBJECT LANDS
- EXISTING CONTOURS
- GRCA CONTOURS
- EXISTING FENCE
- EXISTING EMBANKMENT (SLOPE AS NOTED)
- APPROXIMATE FLOODPLAIN LIMIT (FROM NDSS)
- DRIPLINE
- EXISTING MONITORING WELL
- EXISTING BOREHOLE
- EXISTING MONITORING WELL ELORA MEADOWS
- EXISTING BOREHOLE AINLEY FARM SUBDIVISION
- MW SOIL–MAT (FEB,2022) Elev.=407.34 TC=408.26
- BH SOIL–MAT (OCT, 2021)
- APPROXIMATE MW MTE (JAN, 2024)
- APPROXIMATE BH BLUEPLAN (JUNE, 2023)

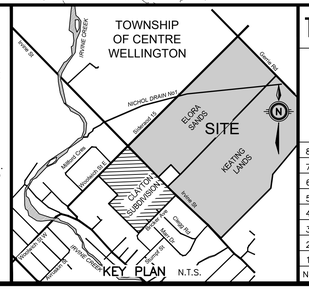
NOTE TO CONTRACTOR :

DO NOT SCALE DRAWINGS.

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED OR REUSED WITHOUT THE ENGINEER'S WRITTEN PERMISSION.

THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.



TOWNSHIP OF CENTRE WELLINGTON

No.	REVISION	BY	YYYY–MM–DD
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.			

GEODETIC BM ELEV. = 387.982m
ELORA POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTRE BASEMENT WINDOW. (HISTORICAL NUMBER 16U117E)

SITE BENCHMARK ELEV. = m

CLIENT
ELORA SANDS DEVELOPMENTS INC.
2555 Meadowpine Blvd. Unit 3 Mississauga Ont.

PROJECT
ELORA SANDS / KEATING LANDS

DRAWING
EXISTING CONDITIONS PLAN

MTE
Engineers, Scientists, Surveyors
519-743-6500

Project Manager S. PETERSON	Project No. 49878-100
Design By MXF	Checked By JEM
Drawn By ACH	Checked By MXF
Surveyed By MTE/BSRD	Drawing No. EC2.1
Date Jan.29/25	
Scale 1:2000	Sheet of