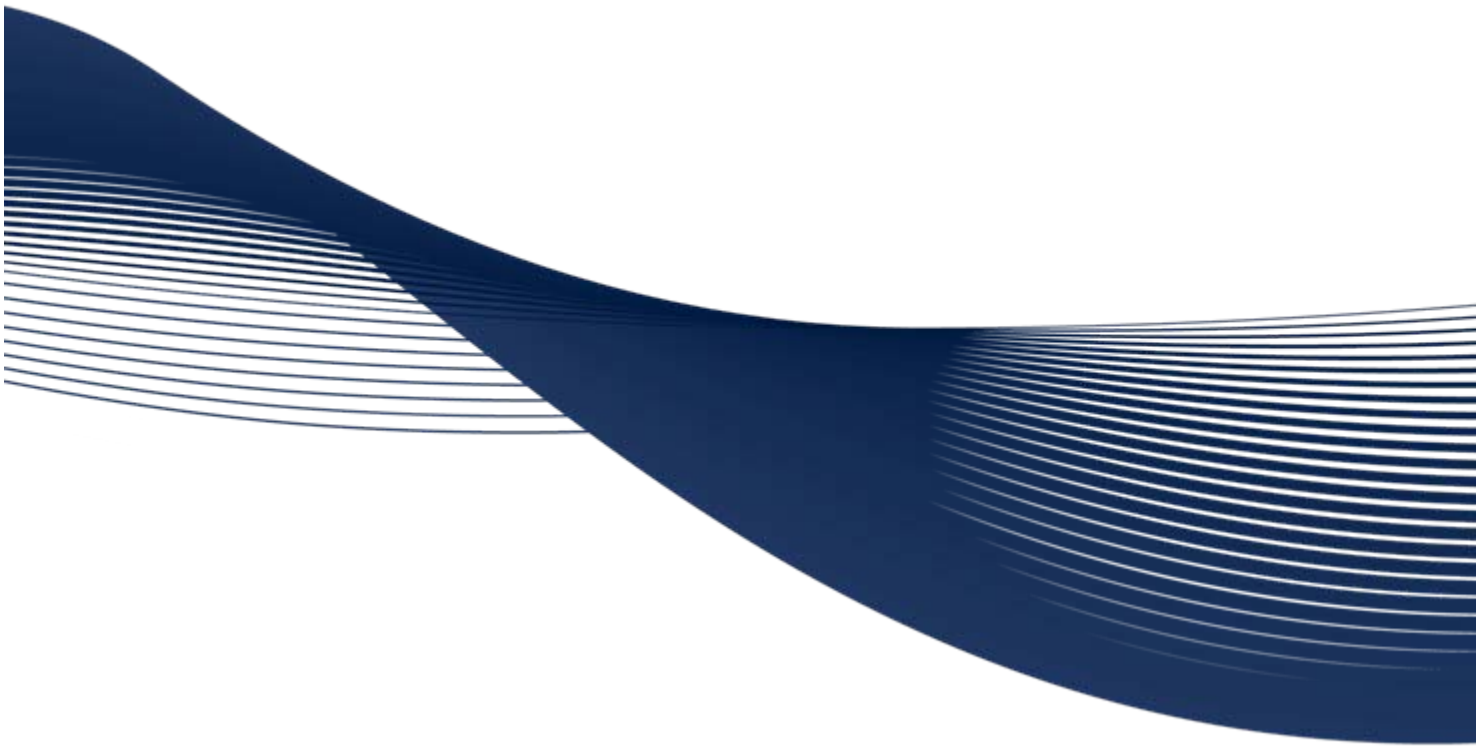
MARIANNEVILLE DEVELOPMENTS LTD.

FUNCTIONAL SERVICING REPORT

Estates of Glenway, Town of Newmarket

Project No.: L09-301



NOVEMBER 2013

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Executive Summary

Cole Engineering Group Ltd. (Cole Engineering) was retained by Marianneville Developments Limited to undertake a Functional Servicing Report in support of the proposed Estates of Glenway Newmarket development. This report examines the existing sanitary and storm sewer conveyance network, water distribution network and stormwater management strategy, and recommends a servicing and road grading scheme to accommodate the proposed development's requirements in accordance with the Town of Newmarket (Town) and Ministry of the Environment (MOE) standards.

The proposed development is situated within the eastern half of the existing Glenway Community, south of Davis Drive, generally between Bathurst Street and Eagle Street and consists of a combination of low, medium and high density residential units (total 730 units) and a small commercial block. The proposed development spans an area of 36.3 ha and is situated within several of the golf course holes of the former Glenway County Club. The proposed development plan consists of a combination of new public right-of-ways (Streets A, B, C and D) and private roads within the Medium Density and Condo Blocks.

A preliminary road grading design for proposed public and private streets has been achieved with road gradients conforming to municipal standards and largely maintaining the current stormwater runoff drainage patterns. Major system storm overland flow will be directed along the roads towards the re-configured stormwater ponds located throughout the site. Major system overland flow from public right-of-ways shall be captured and piped when directed through private property to reach a stormwater pond.

New watermains will be required along proposed right-of-ways and private roads and shall connect to the existing water distribution network surrounding the site. Two Regional pressure districts are located within the proposed development, specifically the Newmarket Central District and Newmarket West District. Based on the elevation range serviced by each pressure district, the majority of proposed development will connect to the higher pressure district (Newmarket West) with the remaining, lower elevation development in the southeast corner of the site connected to the Newmarket Central district.

Sanitary flow generated from the proposed development will be conveyed via new sewers and connected to the existing surrounding sanitary sewer network at various locations. A sanitary flow monitoring program was completed from June 2010 to December 2010 to measure actual sanitary flow and calibrated to the Chicago 24hr Storm based on the recording of several rain events. The intent of the program was to determine a realistic peak sanitary flow rate from the existing Glenway Community compared to the original theoretical design flow for the existing subdivision. In addition to the monitoring program, an update to a previously completed sanitary capacity model (Master Sanitary Sewer Hydraulic Study, R.V. Anderson and Associates, May 2008) was undertaken to include the sanitary peak flows from the proposed development in addition to the peak flows presented in the May 2008 Study. Based on a combination of the monitored data just downstream of the sanitary outlet for the Community (MH110A, SE of Peevers Crescent) and the update to the May 2008 flow analysis, the additional sanitary flows generated from proposed development can be accommodated within the existing local sewer and Western sub-trunk system, with marginal increases to existing theoretical surcharging conditions.

The stormwater management strategy to accommodate proposed development involves upgrading the existing ponds within the eastern half of the former golf course (specifically, Ponds 4A/4B, 6, 8 & 9) to meet the stormwater quality and quantity control requirements. The existing ponds are inline with the existing storm sewer system for the Glenway Community and provide limited stormwater runoff controls or water quality treatment. The ponds will be expanded in area and volume to meet current standards with outlet controls and quality treatment for existing and proposed development within the contributing drainage areas. Quantity control targets are existing pond outflows for the 2-year to 100-year 24 hour SCS storm, by Town's standards. The pond bottoms will be deepened and reshaped to provide Enhanced (Level 1) Quality Control as outlined by the MOE. All components for the all re-configured ponds, i.e. side sloping, safety shelf, maintenance access etc. shall be designed in accordance with Town standards. The re-configured ponds shall be situated within Blocks to be dedicated to the Town for public ownership and maintenance. Access easements shall be provided by the developer to the Town in instances where maintenance access routes to the re-configured ponds are through private condo owned roads.

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1.0 Introduction

1.1. Scope of Functional Servicing Report

Cole Engineering Group Ltd. (Cole Engineering) has been retained by Marianneville Developments Ltd. to prepare a Functional Servicing Report (FSR) in support of Official Plan Amendment, Re-Zoning and Draft Plan of Subdivision applications for a proposed residential development located within the existing Glenway Estates and Country Club Community in the Town of Newmarket (Town), Regional Municipality of York (Region).

This report has been prepared to review the existing sanitary servicing, water distribution network, storm sewer systems and stormwater management features and provide recommendations for their potential improvements required to accommodate proposed development based on the proposed Draft Plan prepared by Zelinka Priamo Limited, revision dated November 2013. This FSR also includes the preliminary road grading design for the proposed development areas covered by the proposed Draft Plan.

1.2. Background Review

The following background studies and information were referenced while preparing this Report:

- As Constructed Engineering Servicing Drawings, Glenway Estates & Country Club, prepared by G.M. Sernas and Associates Limited (file #8202), 1989;
- Stormwater Management Study, Glenway Estates & Country Club, prepared by The Lathem Group Inc., dated December 19, 1983; and,
- Environmental Assessment, Glenway Reservoir Expansion, prepared by GHD Inc., dated July 4, 2011.
- Master Sanitary Sewer Hydraulic Study – Final, Town of Newmarket, prepared by R.V. Anderson and Associates, May 2008

1.3. Site Location

The Glenway Estates and Country Club Community are bordered by Davis Drive (formerly Highway 9) to the north, Bathurst Street to the west and west of Yonge Street to the east. The Community's southern boundary is generally defined by the existing Summerhill Subdivision (Binns Ave.) and the Ray Twinney Recreation Complex.

Situated within the Glenway Community, the subject site is generally located within the eastern half of the Community, bordered by Davis Drive to the north, Eagle Street to the east, Crossland Gate to the south and the existing Hydro One corridor to the west.

Refer to **Figure 1-1** for a depiction of the Glenway Community boundaries.

1.4. Existing Conditions

The Glenway Community consists primarily of low density residential land uses surrounded by an 18-hole golf course. Medium density residential and commercial land uses exist within the northeast quadrant of the Community. The subject site is situated within the eastern half of the 18-hole golf course. The Community is bisected by an existing Hydro One corridor (approximately 38m in width) centrally aligned through the Community from north to south. Four (4) existing hydro towers are aligned within the corridor through the Community.

Spread across the Community, the existing golf course consists of landscaped open space with several stands of trees primarily aligned adjacent to the existing residences. A total of nine (9) existing stormwater ponds are located within the golf course lands, which services the surrounding residential units and the golf course itself. These ponds take the form of water hazards throughout the course and serve an aesthetic as well as functional purpose. Four (4) of the stormwater ponds are located on the eastern half of the golf course with the remaining five (5) ponds located in the western half of the golf course.

Also internal to the Community is the Glenway Reservoir site located at the northwest corner Kirby Crescent. Currently the site has a pump house and chlorination building in addition to an above ground storage reservoir positioned to the west of the pump house. The Region of York (the "Region") has recently completed an Environmental Assessment to locate a second water storage reservoir on the Kirby Crescent site.

In addition to the golf course and low density residential, the existing Glenway Community includes additional land uses within the northeastern quadrant such as retail complexes, restaurants and smaller strip-mall type commercial areas. The southeast corner of the intersection of Eagle Street and Davis Drive contains a private townhouse complex (Newmarket Cooperative), while the Newmarket GO Transit Bus Terminal is located at the southwest corner.

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LOCATION PLAN

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER 2013	PROJECT No.:	L09-301
SCALE:	N.T.S.	FIGURE No.:	1-1

2.0 Proposed Development

The proposed re-development of the eastern half of the existing 18-hole golf course consists primarily of a combination of low, medium and high density residential land uses ranging between the existing hydro corridor to just east of Eagle Street. In addition, a small commercial block is proposed at the southwest corner of Crossland Gate and Davis Drive. The proposed road network and lot layout is based on the Draft Plan of Subdivision prepared by Zelinka Priamo Ltd., revision dated November 2013.

Table 2.1 summarizes the proposed land uses and corresponding development areas.

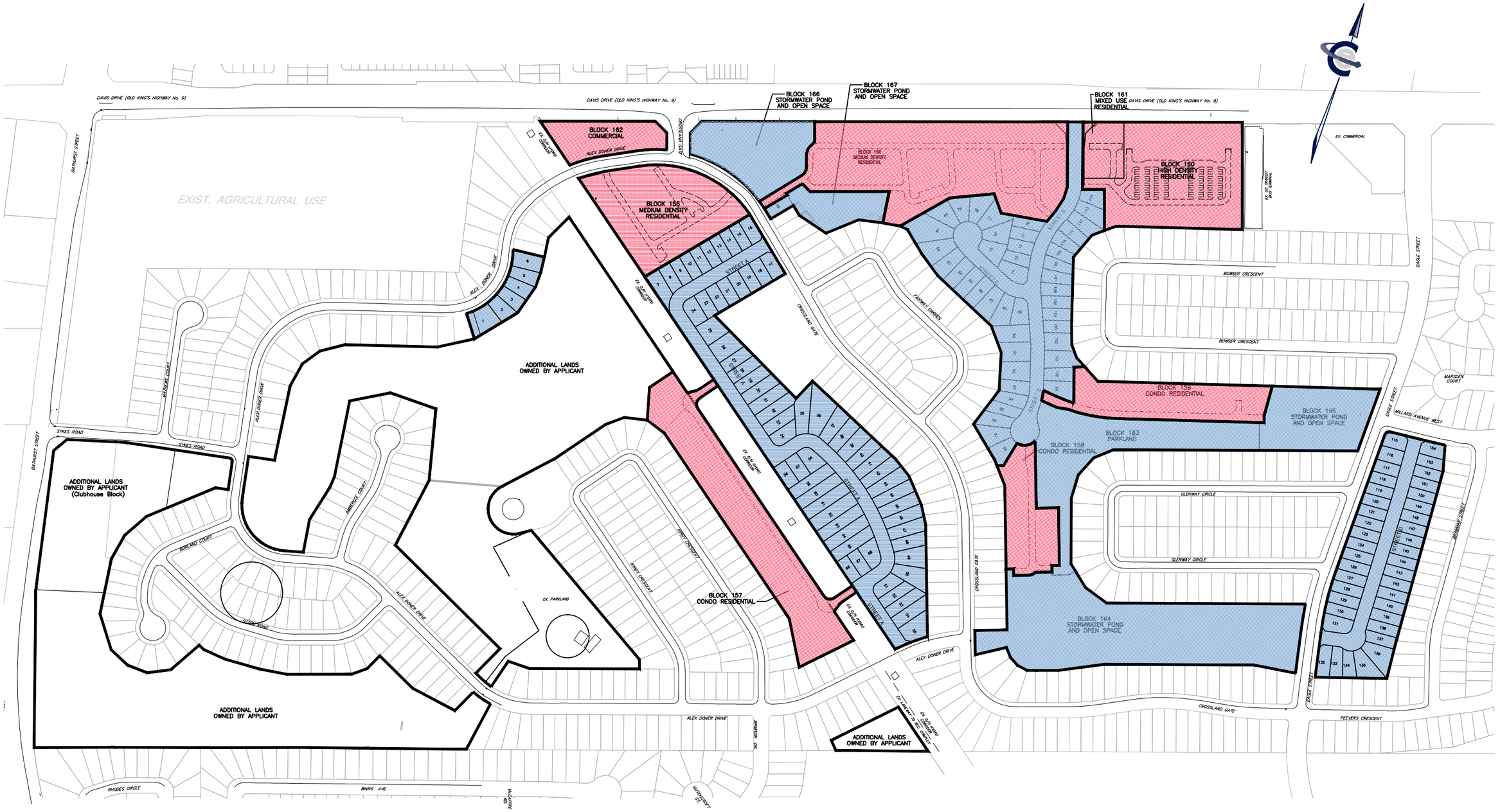
Table 2.1 – Proposed Land Uses and Areas

Land Use	Units	PPU	Population	Areas (hectares)
Residential (Lots 1-111, 115-154)	151	3.38	510	11.14
Institutional/Residential (Lots 112-115)	3	3.38	10	0.22
Residential, Medium Density (Blocks 155-156)	217	2.88	625	5.53
Residential, Condos (Blocks 157 – 159)	55	3.38	186	4.54
Residential, High Density (Block 160)	292	1.95	569	2.34
Institutional/Mixed Use (Block 161)	12	2.88	35	0.37
Commercial (Block 162)				0.65
Parkland (Block 163)				1.84
Stormwater Management (Blocks 164-167)				6.47
Residential, Existing (Block 168)				0.03
Proposed Roadways (Public)				3.18
Total	**730**		**1935**	**36.30**

New municipal right-of-ways are proposed for 145 proposed residential lots along Streets 'A', 'B', 'C' and 'D'. The remaining six (6) proposed residential lots shall front onto existing Alex Doner Drive. The Medium Density, Condo and High Density Blocks will utilize private internal roads, however in certain instances, municipal servicing extensions will be required through the private development blocks within an appropriate easement in favour of the municipality. Servicing requirements are discussed in the following chapters. Refer to **Figure 2-1** which indicates the public and private development areas.

The existing stormwater ponds within the development area to the east of the hydro corridor will continue to service the surrounding lands and will be enhanced to suit the requirements of the proposed development. The ponds are currently located within the private golf course property and appropriate Blocks will be created to transfer ownership of the re-configured ponds to the Town of Newmarket.

To the west of the hydro corridor, six (6) single family dwellings will be constructed along existing Alex Doner Drive. Proposed Condo Block 157 will be developed between the hydro corridor and the existing lots on Kirby Crescent with a private road connection crossing he hydro corridor and connecting to the proposed Street 'A'. The golf course property on the west side of the hydro corridor is intended to be re-designed and re-opened as an executive 9-hole golf course, which is subject to a separate municipal application process.



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PROPOSED DEVELOPMENT WITH MUNICIPAL ROAD FRONTAGE

PROPOSED PRIVATE DEVELOPMENT

RE-DEVELOPMENT BOUNDARIES

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER 2013	PROJECT No.:	L09-301
SCALE:	1:5000	FIGURE No.:	2-1

File : S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development – Newmarket\Cad\Concept DesignL09-301-SITE.dwg, Date :Nov 19, 2013 – 12:08pm, Edit By : DMa

3.0 Area Grading

3.1. Existing Topography

The existing grading conditions within the Glenway Community are reflective of their current use, i.e. as an 18-hole golf course adjacent to an existing residential community.

The existing roads within the residential component of the Community are generally graded with slopes ranging between 1 - 2%. A couple of existing roads were constructed with grades ranging from 4% (Alex Doner Drive) to 6% (Kirby Crescent). The existing roads convey major storm drainage towards the existing stormwater ponds located throughout the golf course lands. The 18-hole golf course lands were graded to suit the operational conditions required of a golf course combined with the original topography. The area proposed for re-development is generally situated within the golf course holes to the east of the hydro corridor with the exception of Condo Block 157 situated immediately to the west of the hydro corridor.

The existing topography within the golf course holes east of the hydro corridor generally ranges from a high elevation of 282.50m in the northeast corner, adjacent to Davis Drive, to a low elevation of 268.0m in the south east corner of the site at Eagle Street and Crossland Gate. Within this elevation range, the existing topography in certain locations exhibits significant gradient differential reflective of the rolling nature of golf courses.

Overland drainage from the golf course holes located to the east of the hydro corridor is currently divided into four (4) separate drainage areas directing runoff to four (4) separate stormwater ponds (Ponds #4a/4b, #6, #8 and #9) which outlet to two (2) separate drainage outlets. The first outlet is located at the southeast corner of the site at Eagle Street, just north of Crossland Gate, directing flows to Western Creek. The second outlet from the site is located at Davis Drive, just east of Crossland Gate and directs flows in a northerly direction across Davis Drive.

3.2. Proposed Grading

A preliminary grading plan has been prepared for the proposed roads and lots within the subject lands. Perimeter grades along the existing residential lots and along the existing abutting municipal right-of-ways will be maintained. The proposed grades along the Davis Drive south streetline are set at 0.10m above the existing centre line of the road, based on Regional requirements. Grading encroachments within the existing Hydro One corridor are proposed to accommodate vertical grade differentials between the existing ground and proposed window roads adjacent the corridor.

The preliminary grading scheme is developed based on the current Town's Engineering Design Standards and Criteria and defines the major system drainage divides to conform to the proposed stormwater management strategy described within **Section 7.0** of this report.

The proposed public roads are generally graded in the range of 1% to 2.5% with only limited sections graded in 3.5% - 3.7% range. The road grading along the private roads ranges from 0.7% to 3.7%.

The proposed development will utilize conventional lot drainage patterns such as Front and Split drainage, where possible. In areas where grading is constricted due to significant grade differences with existing perimeter grades, the use of Walk-Out and Walk-Up lot types utilizing 3:1 sloping will be specified, requiring additional attention at the detailed design stage. As the proposed development can be defined as being of "infill type", the use of rear lot catchbasins will be necessary to contain minor storm runoff within the proposed lots. In certain areas where significant grade differences occur along the site perimeter, retaining walls may be necessary to be constructed within the proposed development area. Specific retaining wall type and material will be confirmed during the detailed design stage, in consultation with the Town's staff and the project landscape architect. In accordance with accepted best practices, including use of slopes (maximum of 3:1) and surface or swale gradients ranging from 2%-5%, the use of retaining walls will be minimized wherever possible.

Following the recommendations of the Tree Preservation Report prepared by York Urbanist, special attention has been used when designing the grading at the southern tip of the cul-de-sac bulb for proposed Street 'B'. A significant tree specimen (90cm dia Ash – Figure L2 -tree 2E-9) was identified for preservation. Under the current grading concept, the existing grades within an 8m radius surrounding the tree will be preserved. In addition to tree 2E-9, perimeter grading along existing residential properties will aim to maintain a 'no grading' buffer to limit the disturbance to existing trees, as detailed within the Tree Preservation Report. Specific protection measures to be applied during construction will be confirmed during the detail design stage.

The grading designs for Block 160 and Block 161 located in the northeast corner of the subject lands (Mixed Use and High Density residential) are developed at the conceptual level only with full details to be provided during the Site Plan submission stage. A schematic internal road grading design is prepared to depict the general drainage direction and compatibility with surrounding perimeter grades.

The preliminary road and lot grading design for Blocks 156, 158 and 159 have been advanced with additional detail since these lands will serve as the corridors linking the existing and proposed municipal roads where the full servicing and major system flow routes are proposed.

The grading design for Medium Density Block 155, previously the location of the Glenway Country Club Clubhouse, will be compatible with the existing streetline grades of Crossland Gate, Alex Doner Drive and maintaining the existing elevations of all other perimeter conditions.

The preliminary road and lot grading design is illustrated on **DWG GR-1**.

3.3. Erosion and Sediment Control

Prior to any construction within the site, a comprehensive Erosion and Sediment Control Plan acceptable to the Town and the Region would be implemented.

The Erosion and Sediment Control Plan will detail all necessary measures and will be designed in accordance with current Town guidelines and the Erosion and Sediment Control Guidelines for Urban Construction. In addition, Town and / or Regional approval will be secured for the location of the temporary construction entrance.

4.0 Water Supply and Distribution System

4.1. Existing Water Supply and Distribution Network

4.1.1. Existing Pressure Districts

The subject site covers approximately 36 ha and is situated to the east of the existing Glenway Reservoir and Kirby Pumping Station, located at 335 Kirby Crescent, Newmarket. Based on Pressure District mapping prepared by The Region, there are three (3) distinct Pressure Districts within the Town of Newmarket, specifically:

1. Newmarket West District (NW);
2. Newmarket Central District (NC); and,
3. Newmarket East District (NE).

The Region's pressure district mapping indicates a pressure zone divide aligned through the Glenway Community, specifically the divide between the Newmarket Central District and Newmarket West District. The Pressure District boundary between the NC and NW pressure zones generally follows the existing Hydro One corridor for the southern portion of the site, then diverts north-easterly towards Eagle Street, wrapping around the western limit of the existing GO Transit facility.

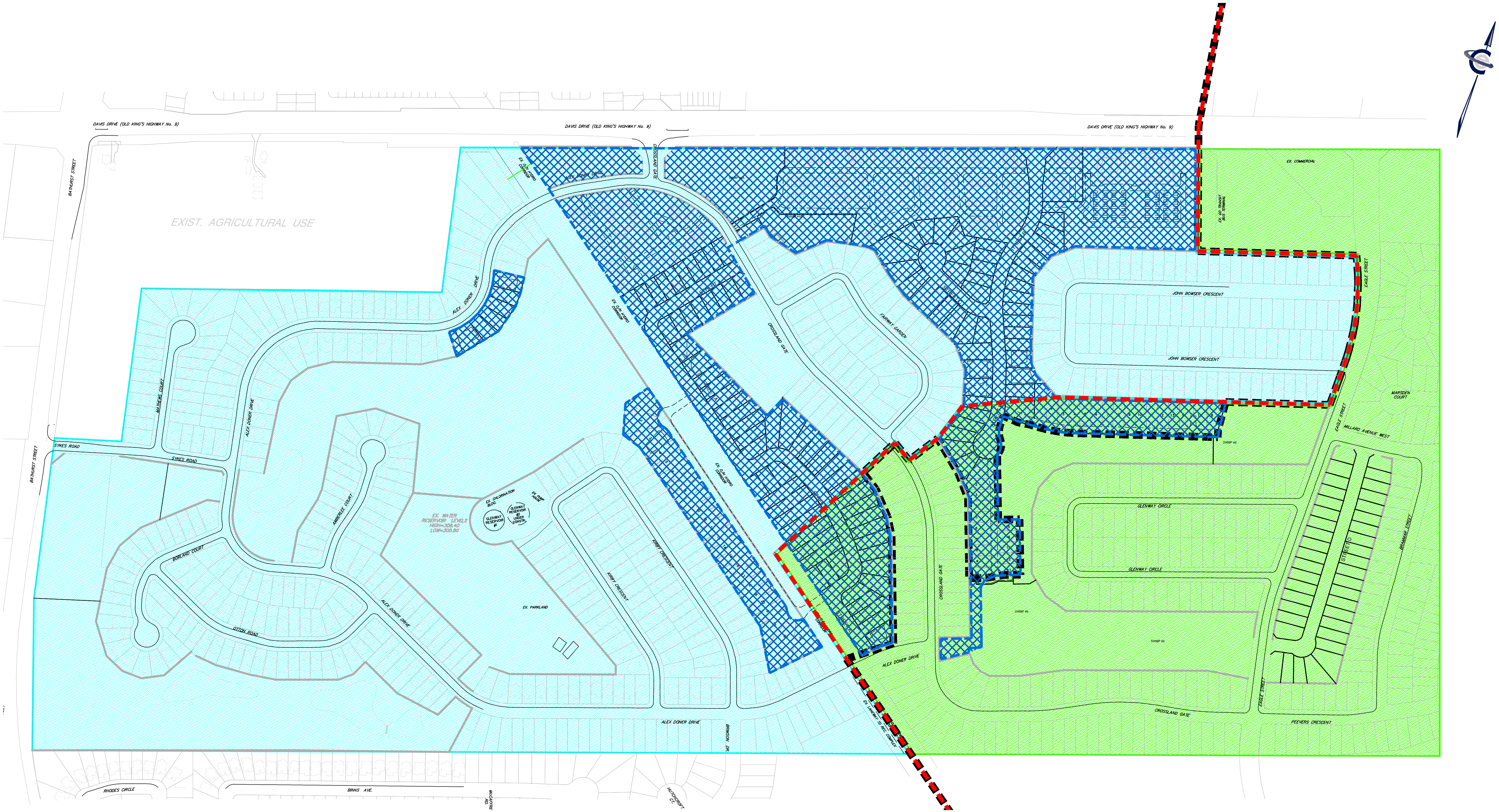
The Newmarket Central District is the largest pressure district within Newmarket and generally extends from Yonge St. / Glenway Community to west of Leslie Street. Municipal water for the NC District is supplied via a series of wells along Yonge Street, from the Newmarket East District via a pressure reducing valve on Davis Drive and from Aurora via watermains directed to Newmarket along Yonge Street and Bayview Avenue. Storage for the NC District is provided from the Glenway Reservoir, London Road Elevated Tank and Magna Elevated Tank.

The Newmarket West District is supplied with municipal water from the Newmarket Central District via the existing Kirby Pumping Station and from Aurora via a watermain extended to Newmarket along Bathurst Street. Storage for the NC District is provided by the Newmarket West Reservoir, located at Bathurst Street, between Mulock Drive and St. John's Sideroad.

Existing residences within the Glenway Community situated to the east of the Hydro One corridor are serviced by municipal water connected to the NC pressure district, while existing residences to the west of the corridor are connected to the NW pressure district.

The existing ground elevation within the site ranges from approximately 282m in the northern portion to 269m in the southern portion of the site.

Based on the Region's Pressure District data, the Glenway Reservoir exhibits a low water level of 300.8m and a high water level of 308.4 m. thus, the NC pressure district can generally service development areas with elevations lower than 273.5m. Development areas with ground elevations higher than 273.5m may be serviced by the NW pressure district, for which the system pressure is controlled by the Newmarket West elevated tank (water level range of 328m to 340 m). Refer to **Figure 4-1** for a depiction of the pressure district zones within the Glenway Community boundaries.



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LEGEND

EXISTING NEWMARKET WEST PRESSURE DISTRICT

EXISTING NEWMARKET CENTRAL PRESSURE DISTRICT

PROPOSED DEVELOPMENT AREAS CONNECTED TO THE NEWMARKET WEST PRESSURE DISTRICT

PROPOSED DEVELOPMENT AREAS CONNECTED TO THE NEWMARKET CENTRAL PRESSURE DISTRICT

APPROXIMATE EXISTING PRESSURE DISTRICT BOUNDARY

PROPOSED PRESSURE DISTRICT BOUNDARY

WATER PRESSURE DISTRICTS

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER 2013	PROJECT No.:	L09-301
SCALE:	1:5000	FIGURE No.:	4-1

File : S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development – Newmarket\Cad\Concept DesignWM.dwg, Date :Nov 21, 2013 – 5:12pm, Edit By : DMa

4.1.2. Existing Water Distribution Network

The site is surrounded by several existing watermains serving both the Newmarket Central and West pressure districts. The following lists presents the existing watermains located generally east of the existing Glenway Reservoir, separated based on their respective pressure zone:

Newmarket Central District (suction supply pipelines to the Glenway Reservoir)

- Eagle Street: 200mm dia. – 300mm dia. watermains from Davis Drive to Peevers Crescent
- Millard Avenue W.: 200mm dia. watermain from Eagle Street easterly
- Crossland Gate: 300mm dia. – 200mm dia. watermains from Eagle Street to the south leg of Fairway Garden
- Easement (Bowser Crescent to Fairway Garden): 300mm dia. watermain
- Easement (Crossland Gate to Kirby Crescent): 300mm dia. watermain
- Alex Doner Drive: 300mm dia. watermain from Crossland Gate to Kirby Crescent
- Kirby Crescent (north and east legs): 400mm dia. watermain

Newmarket West District (discharge pipelines from the Kirby Pumping Station)

- John Bowser Crescent: 200mm – 300mm dia. watermain
- Fairway Garden: 300mm dia. – 150mm dia. watermains
- Crossland Gate: 200mm dia. watermain from south leg of Fairway Garden to Alex Doner Drive
- Easements (Kirby Pumping Station to Alex Doner Drive): 200mm dia. and 400mm dia. watermains within separate easements
- Alex Doner Drive: 200mm dia. watermain from Crossland Gate westerly
- Kirby Crescent: 150mm dia. – 200mm dia. watermains

Refer to **Drawing WAT-1** provided at the end of the report for the location of the existing watermains.

4.1.3. Existing System Pressure

In order to investigate the capabilities of the existing water distribution system in the vicinity of the proposed development, Cole Engineering Group undertook two separate approaches to analyze the existing water flow and pressure surrounding the site. The first approach was to conduct a hydrant flow / pressure tests. Two (2) hydrant flow / pressure tests (one (1) at NC pressure district and another at NW pressure district) were performed along the existing watermain in the vicinity of the proposed development. The second approach was to complete a watermain network analysis via a hydraulic model.

4.1.3.1 Hydrant Flow and Pressure Test Approach

1st test at Newmarket Central pressure district: The first hydrant flow / pressure test was conducted along Alex Doner Drive in the NC pressure district on October 6, 2009. The static pressures are approximately 55 psi (system head = 308m), which is approximately equal to the high water level (water depth = 8m) at the Glenway reservoir. The pressure drops by approximately 4 psi (3m with a corresponding system head of 305m) when it is flowing at 107 L/s. The system head at this flow test location might have been lower (approximately equal to 298 m = 301m - 3 m) if the Glenway Reservoir was near its low water level at 301m (7 m lower than the reservoir water level during the test day).

2nd test at Newmarket West pressure district: The second hydrant flow / pressure test was conducted along Amberlee Crescent in the NW pressure district on October 15, 2009. The static pressures are approximately 65 psi (system head = 332m), which is approximately equal to the 33% full water level (water depth = 4m) at the Newmarket West elevated tank level (if there is no significant head loss in the system). The pressure drops 15 psi (10m, corresponding system head of 321m) when it is flowing at 87 L/s. The pressure at this flow test location might have been lower if the system head is 4 m lower than 332m during the test day.

Refer to **Appendix A.1** for the results of the hydrant flow / pressure tests completed by Applied Fire Technology Inc.

4.1.3.2 Watermain Network Hydraulic Analysis

A water distribution hydraulic model (using InfoWater) was conducted to confirm the proposed watermain sizes are adequate for the proposed development.

The existing watermains in the vicinity of site are reproduced as per Town's updated pressure district map. As suggested by the Town, the water supply boundary conditions coming from the Glenway Pumping Station and a connection on Bathurst Street were considered for the subject site. The system heads in the model were estimated from the previous fire flow test, as well as the water levels at both Glenway reservoir and the Newmarket West elevated tank level. The boundary condition for both Newmarket Central and Newmarket West systems are detailed as follows:

Newmarket Central District: Water is supplied to the subject site from the Glenway Reservoir and from the municipal Wells along Yonge Street between Wellington Road and St. John's Sideroad within the NC system. The Glenway Reservoir levels range from 300.8m to 308.4m. It was assumed that the reservoir is near its 25% full level (302.7m) during the peak hour and near it's top water level (TWL=308.4m) during the minimum hour demand. The same water level was assumed at a dummy reservoir located Eagle Street and south of Davis Drive.

Newmarket West District: Water is supplied to the subject site from the Glenway NW pumping station, as well as water from Newmarket West elevated tank within the NW district. The Newmarket West elevated tank levels range from 327.5m to 308.4m. It was assumed that the tank is near its 25% full level (330.6m) during the peak hour and near it's top water level (TWL=340m) during the minimum hour demand. A dummy reservoir with the levels was placed near Bathurst Street and north of Highway 9, at the connection from the existing 600mm dia. watermain to the 400mm dia. watermain connected to the local distribution system. A dummy reservoir was placed near the Glenway NW pumping station. System head is approximately equal to Newmarket West elevated tank near its low water level of 327.5m.

The model results are shown in **Appendix A1** and the results are detailed in the following sections.

4.2. Design Guidelines

For the purposes of this report, the 2008 MOE Guidelines for the Design of Water Distribution Systems and the Town's design standards for the municipal water distribution system layout were used to estimate the system design pressure and demand requirements for the subject development.

The following design guidelines were used to estimate the water demand for the subject site:

4.2.1. Domestic Water Demand

The average day water demand of 300 L/cap/day was adopted from the Town's 2009 standards.

4.2.2. Peaking Factor

The peaking factors were taken from the Town's 2009 standards. The peaking factors for the Maximum Day and Peak Hour demand scenarios are 2.0 and 3.0 respectively.

4.2.3. Population Density in Residential Development

As per the Town's 2009 standards, the following densities were used to determine the expected populations in the residential developments:

- Single Detached Dwellings: 3.378 ppu
- Semi-Detached Dwellings: 3.378 ppu
- Townhouses: 2.88 ppu
- Apartments: 1.95 ppu

4.2.4. Water Demand for the Commercial Development

The Town's 2009 guidelines provide the following water demand requirements for commercial area:

- Retail & Office: 4 L/d/m^2
- Restaurant: 60 L/d/m^2

4.2.5. Fire Flow

As per the Town's requirement, the minimum fire flow requirement is as follows:

- Detached and semi-detached dwellings: 7,000 L/min (117 L/s)
- Townhouses: 10,000 L/min (167 L/s)
- Apartment: 15,000 L/min (250 L/s)
- Industrial / commercial: 15,900 L/min (265 L/s)

The fire flow for the commercial development was determined using Fire Underwriter's Survey, 1999.

4.2.6. System Pressure

The Town of Newmarket's 2009 standards provides the following system pressure requirements:

- Minimum pressure during peak hourly demand: 350 kPa (50 psi)
- Maximum pressure under any flow scenario: 550 kPa (80 psi)
- Minimum pressure during maximum day + fire flow: 140 kPa (20 psi)

The 2008 MOE Guidelines provide the following system pressure requirements:

- Minimum pressure during peak hourly demand: 275 kPa
- Maximum pressure under any flow scenario: 700 kPa
- Minimum pressure during maximum day + fire flow: 140 kPa

4.2.7. Selection of Watermain Sizes

The suggested Hazen-Williams C factors are to be used to size pipes within the subject site as per the Town's 2009 design standards:

- 150 mm: C = 100
- 200 – 250 mm: C = 110
- 300 mm or larger: C = 120

4.3. Proposed Development

Based on the Draft Plan of Subdivision prepared by Zelinka Priamo Ltd., revision dated November 2013, the proposed land uses for the Glenway Country Club Re-development consists of a combination of low, medium and high density residential uses and a small commercial parcel. A total of 730 residential units are proposed, generally east of the existing Hydro One corridor, with six single lots and a Condo Block 157 situated to the west of the Hydro One corridor.

The proposed residential development shall be connected to existing watermains within either the Newmarket Central or Newmarket West pressure districts, based on the proposed ground elevation surrounding the new units. Development areas exhibiting proposed ground elevations lower than 273.5m shall be connected to the Newmarket Central District while development areas with ground elevations higher than 273.5m will be connected to the Newmarket West District.

4.3.1. Estimated Water Demand

Based on the Town's standards for the proposed residential development area and the MOE's guidelines for proposed commercial area, the estimated water demands for the subject site are summarized within **Table 4.1** below. The domestic water demand for the development requires flows of 8 L/s, 14 L/s and 21 L/s for the average day, maximum day and peak hour conditions, respectively. The Town's required fire flow of 117, 167, 250 and 267 L/s is for the low density residential, medium density residential, high density residential and commercial, respectively. The fire flow for the commercial area is calculated based on criteria from Fire Underwriters Survey 1999, while the remaining development areas rely on the Town's suggested fire flow.

Table 4.1 – Water Demand Estimation

Land Use	Residential (units)	Pop.	Water Demand (L/s)			
			Av. Day	Max day AM	Peak Hour	Fire Flow
Low Density Residential	209	706	2	4	7	117
Medium Density Residential	229	660	3	5	8	167
High Density Residential	292	569	2	4	6	250
Commercial	-	-	1	1	1	167*
Sub-total	**730**	**1935**	**8**	**14**	**21**	**-**

*Fire Flow was estimated from the FUS, 1999 guideline.

Based of the proposed commercial block area (0.65 ha), the required fire flow is 167 L/s using the Fire Underwriters Survey criteria, 1999. It was assumed that the commercial buildings will consist of fire-resistive construction (e.g. fully protected frame, floors and roof, etc.) and limited-combustible occupancies, with a minimum of 3m spacing separation from the other buildings. The building is to be provided with an adequately designed water system conforming to NFPA sprinkler standards. Refer to detailed calculations located in **Appendix A.1**.

4.3.2. Newmarket Central District Connections

One proposed development area is situated below an elevation of 273.5m and will be connected to the Newmarket Central District water distribution network:

- Street 'D' (Single Family Residential): located to the east of Eagle Street; this area exhibits a proposed ground elevation range of approximately 272.80m to 268.80m and shall connect to the existing NC District 200mm dia. watermain on Millard Avenue West and to the existing NC District 200mm dia. watermain on Eagle Street. The proposed municipal watermain shall be aligned along the proposed municipal right-of-way.

The proposed development is situated near the Glenway Reservoir. With the existing 300 mm (and 400 mm) pipeline and current looping system surrounding the proposed development in the NC district, no significant head loss between the Glenway Reservoir and the proposed development is anticipated. The system head for the area connected to NC system is approximately equal to the water level (300.8 m to 308.4 m) of the Glenway Reservoir under normal conditions. The proposed ground elevations are between 268 m and 273 m. The estimated maximum pressure and minimum pressure system for the area to be connected to NC District are summarized in **Table 4.2** and detailed as follows:

4.3.2.1 System Pressure under Normal Operation

The maximum pressure likely occurs at the relatively low ground location (elevation equal = 268m) on Eagle Street, just north of Crossland Gate. The estimated maximum system head is approximately equal to 308.4m (equal to the high water level at Glenway Reservoir) and the maximum pressure is approximately equal to 40m (395 kPa). The minimum pressure likely occurs at the relatively high ground location (elevation = 273m) at the top end of Street D and the minimum pressure is approximately 30m (295 kPa) when the Glenway Reservoir is near its 25% full water level. As shown in **Table 4.2**, the system pressure is less than the Newmarket preferred requirements of 350 kPa but exceeds the minimum pressure requirements of 275 kPa under normal condition as per MOE guidelines.

4.3.2.2 Minimum Pressure under Fire Flow Condition

The minimum pressure likely occurs at the relatively high ground location at the middle of Street D (north of Crossland Gate and Eagle Street intersection), as shown in **Table 4.2**.

Table 4.2 – Proposed System Pressures for the Development Area Connected to NC District

Design Conditions	Maximum*		Minimum**	
	Head (m)	Pressure (m)	Head (m)	Pressure (m)
Normal Operation	308m	40 (390 kPa)	301m	28 (275 kPa)
Maximum Day + Fire Demand	-	-	296m	23 (225 kPa)

*Maximum pressure likely occurs near the relatively low ground elevation (=268 m) on Eagle Street, just north of Crossland Gate and near high system head of 308 m.

**Minimum pressure likely occurs near the relatively high ground elevation (=273 m) at the top end of Street D when the system is near its low system head of 301 m.

As shown in **Table 4.2**, the system pressure exceeds the minimum pressure requirements of 140 kPa for the fire flow condition as per Newmarket standards.

4.3.3. Newmarket West District Connections

The remaining development areas within the site will be connected to the Newmarket West District since the proposed ground elevations in these areas are generally above 273.5m. The proposed development areas within the Newmarket West District can be divided into eight distinct areas and their proposed water connections are described as follows:

- Block 155 (Medium Density Residential) and Block 162 (Commercial): both parcels are located in the northwestern portion of the site and exhibit a proposed ground elevation range of approximately 272.40m to 275.0m and shall connect to the NW District via connections to an existing 200mm dia. watermain along Alex Doner Drive. Private watermains shall be extended within Blocks 155 and 162 to service the proposed townhouse units and commercial development, respectively.
- Block 156 (Medium Density Residential): exhibits a proposed ground elevation range of approximately 273.60m to 281.0m and is situated adjacent to Davis Drive. A proposed private watermain will be extended through the private townhouse development with a connection to the adjacent municipal water distribution network at Alex Doner Drive (to the NW District 200mm dia. main).
- Block 161 (Mixed Use Residential) and Block 160 (High Density Residential): The proposed ground elevation is approximately 282.89m at Block 160 (High Density Residential). Two separate water connections for the townhouse and high rise complex shall be provided from the proposed NW District watermain aligned along Street 'B'. A single water connection may be provided if the two Blocks proceed under a single Site Plan.
- Lots 1 - 6 (Single Family Residential): fronting along Alex Doner Drive, these six proposed lots located to the west of the existing Hydro One corridor will be individually connected to the existing 200mm dia. watermain aligned within Alex Doner Drive.
- Street 'A' (Single Family Residential): situated adjacent to the existing Hydro One corridor, this area exhibits a proposed ground elevation range of approximately 272.0m to 280.0m. A proposed municipal watermain shall be aligned along the proposed right-of-way connecting at the southern end to a proposed NW District watermain extension aligned easterly along Alex Doner Drive from its current terminus at the existing Hydro One corridor. At the northern end of Street 'A', the proposed watermain shall connect to the existing NW District watermain along Alex Doner Drive.
- Streets 'B' and 'C' (Single Family Residential): situated between Fairway Garden and John Bowser Crescent, this area exhibits a proposed ground elevation range of approximately 273.50m to 281.0m. A proposed municipal watermain shall be aligned along the proposed right-of-way connecting to a new watermain aligned along the south side of Davis Drive (connected from the existing 200mm dia. watermain at the intersection of Crossland Gate and Alex Doner Drive). A second connection for Street B shall occur via an interconnection with the existing 300mm dia. watermain crossing Street B from John Bowser Crescent to Fairway Garden.
- Block 159 (Condo Residential): this area exhibits a proposed ground elevation range of approximately 272.50m to 277.50m. A private NW District watermain shall be extended internally through Block 159, with a connection to the proposed NW District municipal watermain on Street 'B'.

- Block 158 (Condo Residential): this area exhibits a proposed ground elevation range of approximately 270.75m to 273.25m. A private NW District watermain will be extended through the private townhouse development. As a result of extending the NW District municipal watermain through Block 158, the proposed condo units may require individual pressure reducing fixtures on their unit water service connections since the proposed elevation for this area is below the threshold of 273.50m for the NW District and these units may otherwise be subject to higher than acceptable water pressure.

The proposed connection information above is based on the Region's water system information and assuming the system head is approximately equal to the water level (327.5 to 340m) at the Newmarket West Elevated Tank under normal operating conditions. The estimated maximum pressure and minimum pressure system for the area to be connected to NW are summarized in **Table 4.3** and detailed as follows:

4.3.3.1 System Pressure under Normal Operation

The maximum pressure likely occurs at the relatively low ground location (elevation equal = 271m) near Block 158 (Condo residential). The estimated system head is approximately equal to 340m (equal to the high water level at Newmarket west elevated tank) and the maximum pressure is approximately equal to 69m (680 kPa). The minimum pressure likely occurs at the relatively high ground location (elevation = 283m) near Block 160 (High Density apartment residential). It is approximately equal to 45m (440 kPa) under normal operation.

Refer to **Appendix A1** for the model output indicating that the entire subject site within the NW district are above the Town's preferred minimum pressure requirements of 350 kPa. The entire site virtually exceeds the Town's preferred pressure of 550 kPa but below 700 kPa except for a small portion of areas along Condo Block 158 when the Glenway NW pumps are in operation and when NW reservoir is near its high water level.

The system head near Glenway NW pumping station and the Town's model shall be reviewed to confirm the maximum system head in the vicinity of the subject site and to determine if there is a need for a PRV to be installed at the municipality pipeline or at connections to each units within Condo Block 158.

4.3.3.2 Minimum System Pressure under Fire Flow

The minimum pressure likely occurs at the relatively high ground location and large required fire flow near Block 160 (High Density apartment residential). The required fire flow is 250 L/s as per Town's guideline, the estimated system head is approximately equal to 304m when the system head is near it's low level (328 m, the lowest water level at Newmarket West elevated tank).

The estimated system pressure from the hydraulic model are shown in **Appendix A1** and summarized in **Table 4.3**.

Table 4.3 – Proposed System Pressures for the Area connection to NW

Design Conditions	Maximum *		Minimum**	
	Head (m)	Pressure (kPa)	Head (m)	Pressure (kPa)
Normal Operation	340m	69m (680kPa)	328m	45m (441 kPa)
Maximum Day + Fire Demand	-	-	304m	21 (206 kPa)

*****Maximum pressure likely occurs near the relatively low ground elevation (=271 m) near Block 158 (Condos Residential) and near high system head of 340m.

**Minimum pressure likely occurs near the relatively high ground elevation (=283 m) at the Block 160 High Density Residential when the system is near its low system head of 328m.

As shown in Table 4.3, the system pressure exceeds the minimum pressure requirements of 140 kPa for the fire flow condition as per Town's guidelines.

5.0 Storm Drainage

5.1. Minor Storm Drainage System

The minor storm drainage system for the overall plan area will be designed in accordance with the Town and MOE criteria, including the following criteria:

- Storm sewers to be sized to accommodate runoff from a 5-year storm event;
- Minimum flow velocity – 0.8 m/s;
- Maximum flow velocity – 4.0 m/s;
- Minimum pipe size – 300 mm; and,
- Minimum pipe depth – 2.7 m measured to obvert.

As defined by the above standards, the minor storm flows will be captured by the underground sewers. As all post development drainage basins are greater than 2.0 ha, quality and quantity control can be provided by the re-configuration of the existing stormwater management ponds. The proposed sewers will be constructed along the municipal and private roads closely following typical road cross-section configurations. The sewers will outlet to the existing Stormwater Management Ponds 4A, 4B, 6, 8 and 9 all being positioned east of the existing Hydro Corridor.

The proposed configuration of the storm sewer system is shown schematically on **Dwg. STM-1**.

5.1.1. Proposed Storm Sewer Connections and HGL Analysis

The proposed storm sewer system for the overall development area can be divided into five separate drainage sheds and analyzed independently for proposed connections to existing storm infrastructure, under both the 5-year and 100-year storm conditions. The five drainage sheds are defined as:

- Northern Drainage Shed (Tributary to Ponds 4A and 4B)
- East Drainage Shed (Tributary to Pond 8)
- Central Drainage Shed-A (Tributary to Pond 6, from the north)
- Central Drainage Shed-B (Tributary to Pond 6, from the west)
- Southeast Drainage Shed (Tributary to Pond 9, from the east)

The following sections provide storm sewer analysis of existing and proposed systems plus hydraulic grade line impacts due to the proposed maximum water levels within the re-configured stormwater management ponds.

5.1.1.1 Northern Drainage Shed (Tributary to Ponds 4A and 4B)

Re-configured stormwater management ponds 4A and 4B will accept storm drainage from proposed development Blocks 155, 156, 160, 161, 162, 168 and the northern portions of Streets A, B and C, in addition to existing drainage areas. The proposed operating levels for Ponds 4A and 4B are 269.7m (Normal Water Level) and 271.7m (100-Year Water Level and Spillway Elevation). The pre-development spillway elevation for pond 4A is 271.74m towards Davis Drive, as per as-built engineering drawings prepared by EMC Group, 1995.

New storm sewers will be constructed within the public and private roads and convey runoff to the ponds and will operate largely independently of existing storm sewers. The one proposed connection of new storm sewers to the existing system is at the proposed outfall to pond 4A, however the connection to existing storm sewer occurs within the SWM Pond Block 166 and does not affect the 5-year conveyance capacity of the existing system.

With respect to hydraulic grade line impacts to existing and proposed storm sewers, the spillway elevation for pond 4A will be lowered by 0.04m, therefore no impacts to existing sewers is expected. In addition, the existing surrounding residences are all utilizing sump pumps with no basement connections to the existing storm sewer network. Proposed Lots 1 – 6 on Alex Doner Drive will require sump pumps as the existing storm sewer fronting these lots was not designed for gravity foundation drains. The proposed Medium Density units situated to the east and west of the proposed pond will be situated along private roads with centerline grades as low as 273.00m, which provides 1.30m freeboard from the pond 4A spillway elevation. A hydraulic grade line analysis and minimum basement floor elevations for units affected by the pond operating levels will be analyzed at the Site Plan stage for the surrounding Medium Density Blocks.

With respect to the proposed single units fronting on proposed municipal right-of-ways (Streets A, B and C), the lowest road elevation on these roads is 275.75m, which provides 4m freeboad above the spillway elevation for pond 4A and hydraulic impacts on proposed basements are not expected which will be confirmed at the detailed design stage through the completion of a hydraulic grade line analysis. Catchbasin inlet control devices should be utilized to capture and maintain the 5-year storm flow rate within new municipal storm sewers.

5.1.1.2 East Drainage Shed (Tributary to Pond 8)

Re-configured stormwater management pond 8 will accept storm drainage from proposed development Block 159, in addition to existing drainage areas. The proposed operating levels for pond 8 are 269.90m (Normal Water Level), 271.90m (100-Year Water Level) and 272.50m (Spillway). The pre-development spillway elevation for pond 8 is 272.90m towards Eagle Street, as per as-built engineering drawings prepared by EMC Group, 1995, which is questionable as the lowest adjacent lot grade of existing residences to the south is 272.11m and can be considered the pre-development spill elevation.

New storm sewers will be constructed along the private road and convey runoff to the pond and will operate independently of existing storm sewers with the exception of the connection to the existing storm sewer entering Pond 8 and does not affect the 5-year conveyance capacity of the existing external storm sewer system.

With respect to hydraulic grade line impacts to existing and proposed storm sewers, the existing surrounding development are all utilizing sump pumps, therefore no impacts to existing homes is expected. The proposed Condo units will be situated along a private road with centerline grades as low as 273.50m, which provides 1.0m freeboard from the proposed pond 8 spillway elevation. The Condo units within Block 159 will likely be graded to accommodate Front Walk Up type units, where the basement elevation is typically set at or above the proposed private road elevation, thereby negating the need for foundation drainage and hydraulic impact concerns. Unit types will be defined at the Site Plan stage and a hydraulic grade line analysis should be completed if basements or utility spaces are proposed below ground which would require protection from the hydraulic impacts of the pond 8 operating levels.

5.1.1.3 Central Drainage Shed – A (Tributary to Pond 6, from the north)

Re-configured stormwater management pond 6 will accept storm drainage from the north from proposed development Condo Block 158 and the southern portion of Street B. The proposed operating levels for pond 6 are 265.10m (Normal Water Level), 267.10m (100-Year Water Level) and 267.85m (Spillway). The pre-development spillway elevation for pond 6 is 268.00m, which is the lowest lot grade along the rear of existing residences to the south, occurring through pond 9 at Eagle Street.

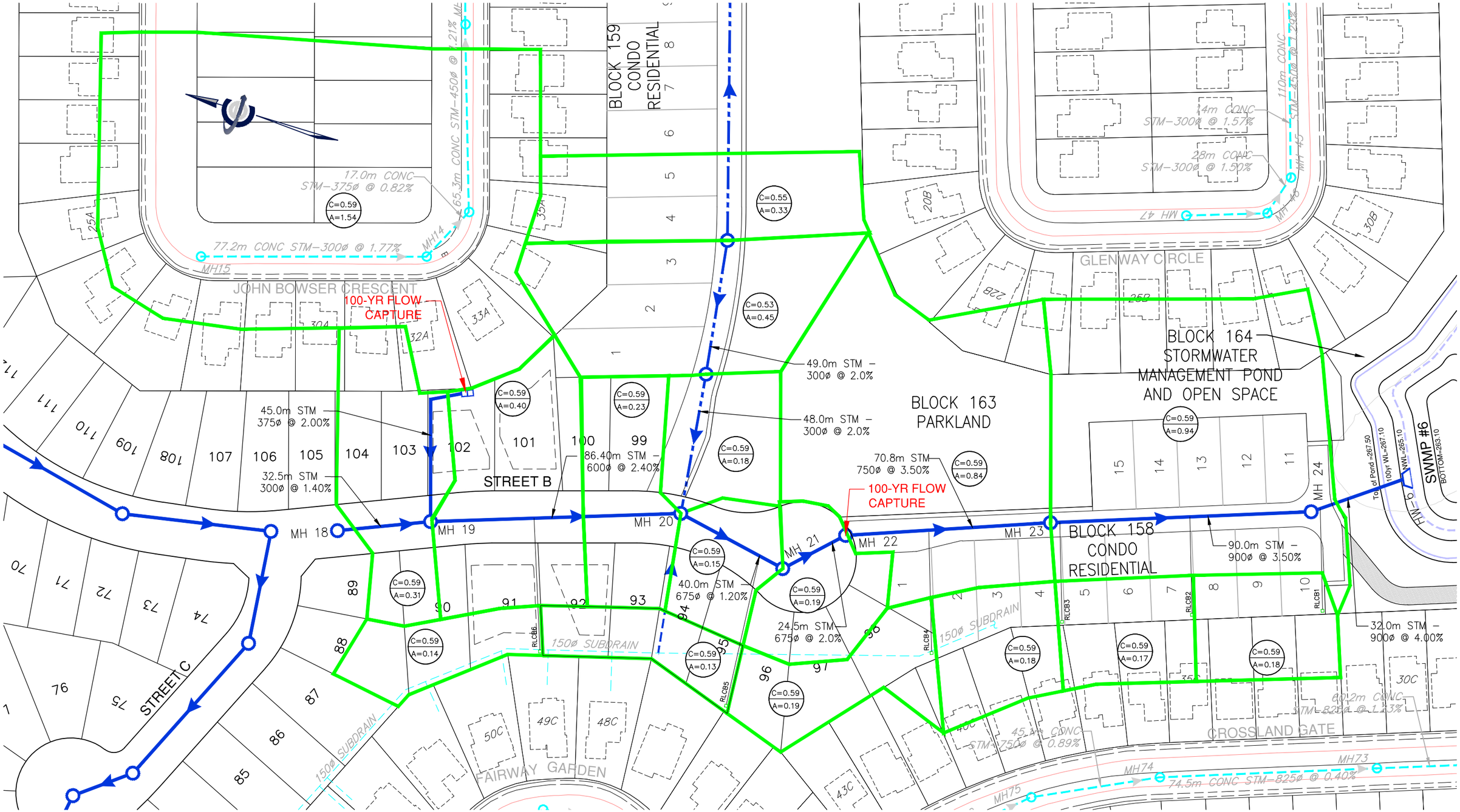
New storm sewers will be constructed along the private and public roads, conveying runoff to pond 6. The proposed storm sewers to the north of pond 6 will operate independently of existing storm sewers. Major system storm capture will need to be considered at the rear of proposed lot 102 on Street B to prevent impacts due of the current overland flow route from the southwest corner of John Bowser Crescent.

With respect to hydraulic grade line impacts to proposed storm sewers, the proposed Condo units will be situated along a private road with centerline grades as low as 270.50m, which provides 2.65m freeboard from the proposed Pond 6 spillway elevation, which is sufficient to protect typical depth basements from hydraulic grade line constraints and is indicative that the use of gravity foundation drains will be feasible. Similarly, the proposed road grades along proposed public Street B are 274.75 at their lowest point which is significantly higher than the proposed spillway elevation for pond 6 indicating that gravity foundation drains will be feasible. A preliminary 100-year HGL design sheet has been prepared to demonstrate that high water levels in pond 6 will not impact the use of gravity foundation drains for proposed upstream units. Refer to **Figure 5-1** for a depiction of the proposed development drainage areas and refer to **Appendix B.2** for the 100-year storm sewer design sheet for the Central Drainage Shed-A (Tributary to Pond 6, from the north).

At the detailed design stage, a hydraulic grade line analysis will be completed to confirm whether minimum basement elevations are required for any units within Condo Block 158 and confirm that hydraulic impacts under the 100-year storm event will not impact proposed basements. The design of new storm sewers should incorporate the use of catchbasin inlet control devices and oversizing sewers, as required, to control hydraulic effects.

5.1.1.4 Central Drainage Shed – B (Tributary to Pond 6, from the west)

Re-configured stormwater management pond 6 will accept storm drainage from the west from proposed development Condo Block 157 and a significant portion of Street A, in addition to existing drainage. The proposed operating levels for pond 6 are 265.10m (Normal Water Level), 267.10m (100-Year Water Level) and 267.85m (Spillway). The pre-development spillway elevation for pond 6 is 268.00m, which is the lowest grade occurring adjacent to pond 9 at Eagle Street.



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LEGEND

C=0.50 / A=0.78 — RUN–OFF COEFFICIENT / PROP. DRAINAGE AREA (ha)

- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- EXISTING STORM SEWER
- EXISTING STORM MANHOLE
- PROPOSED STORM DRAINAGE AREA BOUNDARY

CENTRAL DRAINAGE SHED-A
(TRIBUTARY TO POND 6, FROM THE NORTH)

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER 2013	PROJECT No.:	L09-301
SCALE:	1:1250	FIGURE No.:	5-1

File : S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09–301 Marianneville Development – Newmarket\Cad\Concept DesignFIG 5–1.dwg, Date :Nov 22, 2013 – 10:51am, Edit By : DMa

New storm sewers will be constructed along the private and public roads, conveying runoff to pond 6 via a connection to an existing 1050mm dia. to 1500mm dia storm sewer along Alex Doner Drive. Currently, an existing 675mm dia. storm sewer and ditchinlet catchbasin is situated at the south east corner of the proposed development area, just to the north of Alex Doner Drive and adjacent the hydro corridor, collecting pre-development flow at a rate of 453 L/s according to the original Glenway Community 5-year storm design sheets prepared by G.M. Sernas. Under post development conditions, the 5-year flow rate will increase to 920 L/s, therefore a 5-year and 100-year analysis of the existing downstream sewers (two legs) along Alex Doner Drive to the pond 6 inlet headwall has been completed to confirm capacity.

Under 5-year conditions with post development flows from Condo Block 157 and Street A, the existing 1200mm dia. downstream sewer leg from MH71 to MH70 continues to function under free flow conditions at 62% full. The next downstream existing sewer leg from MH70 to Pond6 inlet will operate at 108% under 5-year storm conditions and will experience minor surcharging. As the neighbouring houses are serviced by sump pumps, the minor surcharging is not considered detrimental.

Under 100-year conditions, the existing hydraulic grade line was analyzed for the existing storm sewer network currently discharging to pond 6, which provided a starting HGL elevation of 269.74m at the proposed connection location, ex MH71. Based on a preliminary catchbasin layout and sewer sizing design for Condo Block 157 and Street A, the HGL analysis indicates that all units in this area can be serviced with gravity foundation drains.

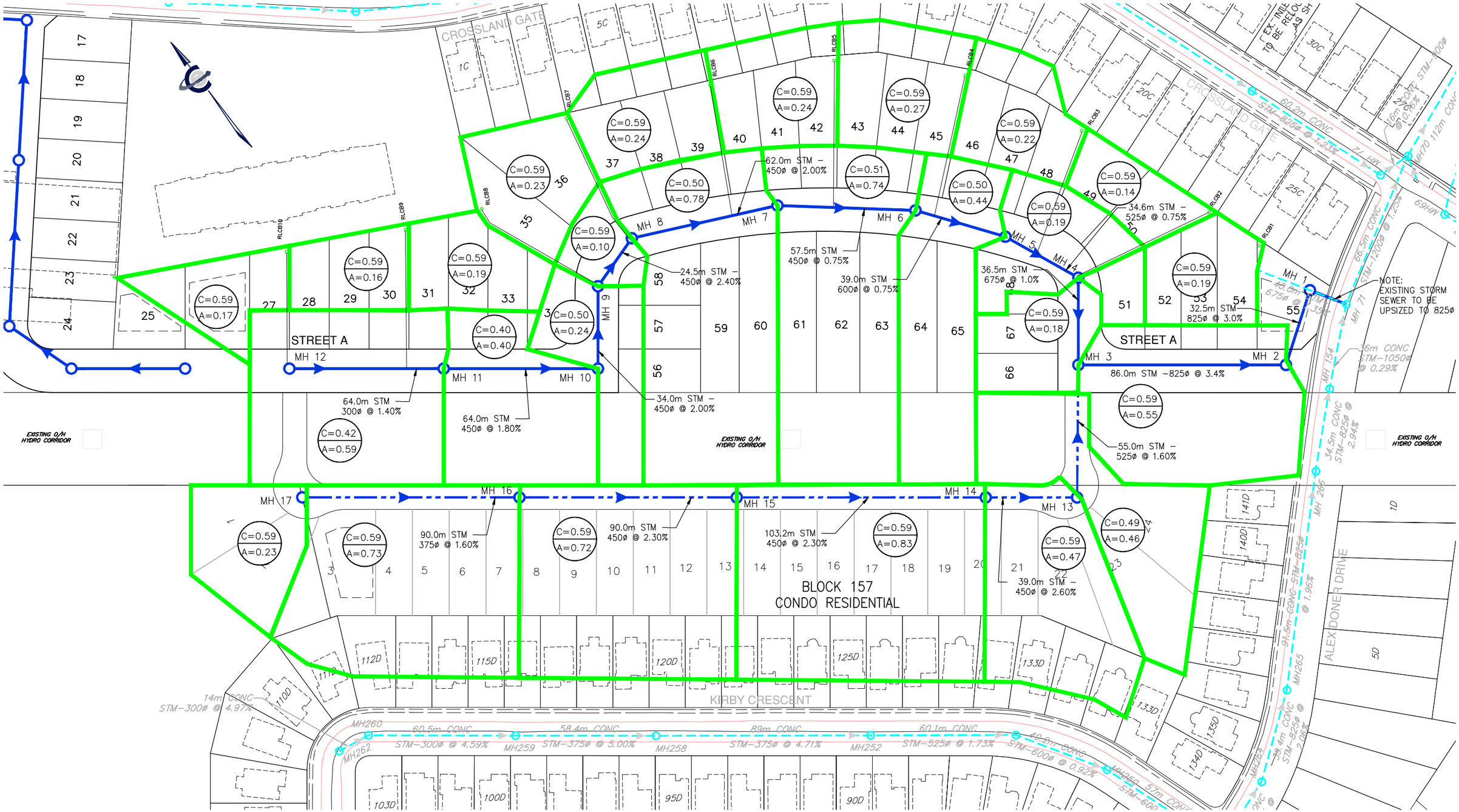
Refer to **Figure 5-2** for a depiction of the proposed development drainage areas and refer to **Appendix B.3** for the 5-year and 100-year storm sewer design sheets for the Central Drainage Shed-B (Tributary to Pond 6, from the west).

5.1.1.5 Southeast Drainage Shed (Tributary to Pond 9, from the east)

Re-configured stormwater management pond 9 will accept storm drainage from the east from proposed development area, Street D, in addition to existing drainage. The proposed operating levels for pond 9 are 264.45m (Normal Water Level), 266.45m (100-Year Water Level) and 267.85m (Spillway). The pre-development spillway elevation for pond 6 is 268.00m, which is the lowest lot grade along the rear of existing residences to the south, occurring through pond 9 at Eagle Street.

New storm sewers will be constructed along public road, Street D, conveying runoff to pond 9 and will operate independently of existing storm sewers along Eagle Street, with no interconnection.

With respect to hydraulic grade line impacts to proposed storm sewers, the proposed single units along Street D will be situated along a public road with centerline grades as low as 268.50m nearest to pond 9, which provides 0.65m freeboard from the road grade to the proposed pond 9 spillway elevation. Typically a minimum of 1.8m vertical distance from road centerline to expected basement elevation plus 0.5m buffer is required vertically to ensure no hydraulic impact to the finished basement elevations, thus gravity foundation connections will not be possible and approximately 10 proposed houses will require sump pumps along the southern portion of Street D. As the road grades for the central and northern sections of Street D increase up to 272.75m, a gravity foundation drain for the proposed houses further north along Street D will be feasible. Refer to **Figure 5-3** for a depiction of the proposed development drainage areas and refer to **Appendix B.4** for the associated 100-year storm sewer design sheet for the Southeast Drainage Shed.



COLE ENGINEERING
70 VALLEYWOOD DRIVE, MARKHAM, ON L3R 4T5
T:416.987.6161 / 905.940.6161 F:905.940.2064

LEGEND

C=0.50 A=0.78 — RUN–OFF COEFFICIENT / PROP. DRAINAGE AREA (ha)

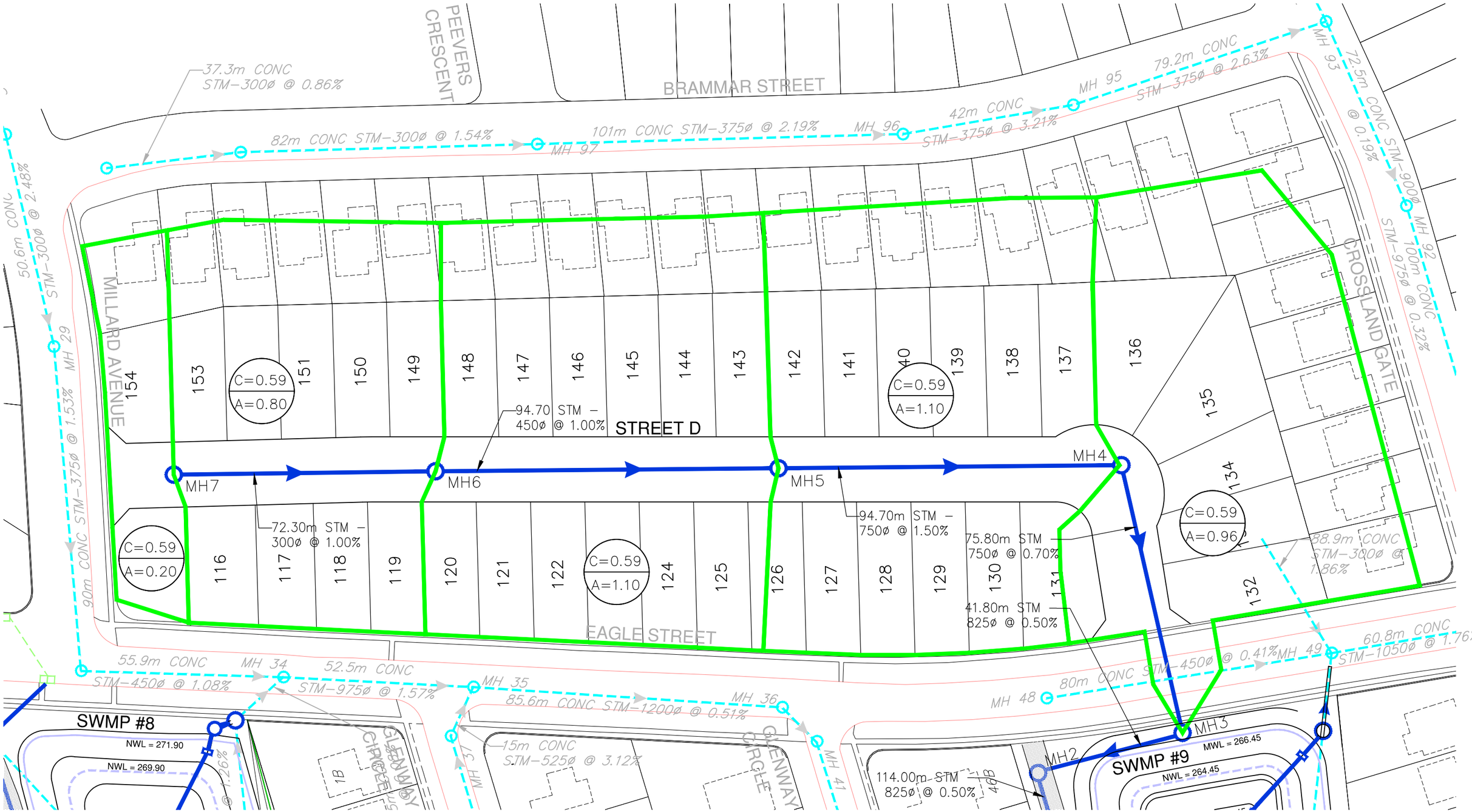
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- EXISTING STORM SEWER
- EXISTING STORM MANHOLE
- PROPOSED STORM DRAINAGE AREA BOUNDARY

CENTRAL DRAINAGE SHED-B
(TRIBUTARY TO POND 6, FROM THE WEST)

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER 2013	PROJECT No.:	L09-301
SCALE:	1:1500	FIGURE No.:	5-2

File : S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development – Newmarket\Cad\Concept DesignFIG 5-2.dwg, Date :Nov 21, 2013 – 12:18pm, Edit By : DMa



COLE ENGINEERING
70 VALLEYWOOD DRIVE, MARKHAM, ON L3R 4T5
T:416.987.6161 / 905.940.6161 F:905.940.2064

LEGEND

C=0.50 — RUN–OFF COEFFICIENT
A=0.78 — PROP. DRAINAGE AREA (ha)

PROPOSED STORM SEWER
PROPOSED STORM MANHOLE
EXISTING STORM SEWER
EXISTING STORM MANHOLE
PROPOSED STORM DRAINAGE AREA BOUNDARY

SOUTHEAST DRAINAGE SHED
(TRIBUTARY TO POND 9, FROM THE EAST)

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER 2013	PROJECT No.:	L09-301
SCALE:	1:1000	FIGURE No.:	5-3

File : S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development – Newmarket\Cad\Concept DesignFIG 5-3.dwg, Date :Nov 21, 2013 – 2:33pm, Edit By : DMa

A hydraulic grade line analysis will be completed at the detailed design stage to assess the limits that hydraulic impacts under the 100-year storm event will impact proposed basements. The design of new storm sewers should incorporate the use of minimum basement elevations, catchbasin inlet control devices and oversizing sewers, as required, to control hydraulic effects.

5.2. Major Storm Drainage System

Storm drainage flows exceeding the design capacity of the underground sewers, which are sized to convey the minor storm flows, will be directed overland along the road surfaces. The use of inlet control devices (ICD's) placed in catchbasins will be implemented, where necessary, to control the rate of stormwater entering the storm sewers. Specific positions for the ICD's will be established at the detailed design stage. The conveyance capacity of the proposed roads will also be analyzed during final design stage, taking into consideration width of pavement, type of curb and road gradient. Any overland flows directed along the municipal roads will be fully contained within the street right-of-way, while for the private roads the analysis will take into consideration the minimum horizontal and vertical distances to any structure (garage, home). Major flows conveyed on the municipal road surface will be captured into the underground mains before entering the private development Blocks. The need for easements overtop the major storm capture sewer and their extent will be confirmed during detailed design stage when final configuration of the development plan is established.

As described above, all major storm runoff will be directed to the existing stormwater ponds 4A 4B, 6, 8 and 9. **Section 7.0** of this FSR provides functional design details for the improvements to the existing stormwater ponds to accommodate post-development drainage conditions.

6.0 Sanitary Sewers

6.1. Existing Conditions

The existing municipal sanitary sewer network servicing the Glenway Community is composed of two (2) main branches ranging in size from 250mm dia. to 450mm dia. Generally, sanitary flows are conveyed from the northwest to southeast direction, towards an existing 450mm dia. sanitary sub-trunk sewer located along Peevers Crescent.

The main branch of the sanitary sewer network within the Community is aligned along Peevers Crescent and Crossland Gate and conveys sanitary flows in a southeasterly direction. The main branch services the majority of the existing Glenway residential community, west of Eagle Street. The sewer size ranges between 300mm dia. to 450mm dia. for a significant section of the downstream sewer. The second branch of the sanitary sewer network is aligned along Eagle Street and directs sanitary flows southerly towards the Peevers Crescent sanitary sub-trunk. The Eagle Street sanitary sewer services the easterly portion of the Glenway Community, including the existing Go Bus Station at Eagle Street and Davis Drive and commercial lands located in the northwest corner of Millard Avenue W. and Yonge Street. The sewer branches combine and convey sanitary flow through an existing 450mm dia. sanitary sub-trunk outleting from the southeast corner of Peevers Crescent, just south of the Region's Administrative Centre. The 450mm dia. sub-trunk directs sewage towards the intersection of Yonge Street and Eagle Street, through York Region's open space and parking area to the south of the Administrative Centre.

Based on the "As Constructed" Sanitary Sewer Design Sheets for the Glenway Community, prepared by G.M. Sernas & Associates, revision dated January 3, 1995, the theoretical design peak flow rate (including an allowance for infiltration) from the entire Glenway Community is calculated at 177 L/s. This theoretical sanitary sewer flow rate was designed between Ex. MH120A to Ex. MH104A / Ex. MH 110A. Refer to **Appendix B** for the As Constructed Sanitary Sewer design sheet by G.M. Sernas & Associates. Based on the municipal standards available when the original Glenway subdivision was designed, the following sanitary flow rates were used to develop design peak flows:

- Single Family (15m): 0.0013 cms/ha
- Single Family (9.75m): 0.0016 cms/ha
- Commercial / Industrial: 0.0017 cms/ha
- School / Multi Family: 0.0025 cms/ha

Compared to present day municipal standards to calculate sanitary flow generation, the above noted flow rates are conservative and produce higher design flows.

Downstream of Ex. MH 110A, additional sewage is directed easterly towards the Glenway Community's sanitary outlet sewer, specifically towards Ex. MH 112A and directed easterly across Yonge Street. Downstream of Ex. MH 112A, the existing sanitary trunk system is referred to as the *Western Sub-Trunk Sanitary Sewer.* The Western Sub-Trunk Sanitary Sewer conveys flows northeasterly towards the Newmarket Sewage Pumping Station.

6.1.1. Methodologies for Sanitary Sewer Capacity Analysis

Various methodologies are available to assess the capacity of the sanitary sewage conveyance network surrounding and downstream of the proposed development which includes desktop review, theoretical flow modeling and actual flow monitoring/calibrated modeling or any combination of these.

This Report focuses on three distinct sanitary sewer capacity approaches, as described below:

1) **Existing Sanitary Flow Analysis – Local System Actual Flow Monitoring**

   This approach relies on calibrating a model based on actual sanitary sewage flow monitoring conducted within existing MH110A, located just downstream of the Glenway Community, and comparing he results to the original sanitary sewer design sheets (theoretical design flow rates) as prepared for the Glenway Subdivision in the mid 1980's. The selection of existing MH110A for the monitoring station location was determined based on the intent to monitor flows within a Town owned sanitary sub-trunk conveying flows from the existing Glenway Community and immediate surrounding areas, all within the same sub-trunk sewer shed. MH110A was the furthest downstream sub-trunk manhole that best represented this condition within the Crossland Gate Sub-Trunk sewer shed and the intent was to ascertain the degree to which actual sewage flow rates were lower than theoretical design flow rates.

   This analysis is discussed within **Section 6.2**.

2) **Existing Sanitary Flow Analysis – Update to Downstream Theoretical Flow Model**

   This approach relies on an update to the analysis presented within a previously completed sanitary capacity study prepared by R.V. Anderson and Associates titled, Master Sanitary Sewer Hydraulic Study – Final, Town of Newmarket, dated May 2008.

   The Glenway Community conveys sewage to a downstream sanitary sewer called the Western Sanitary Sub-Trunk. The Western Sanitary Sub-Trunk (among others) were analysed within the R.V. Anderson Study to assess peak flow and capacity conditions under the 100-year storm event. This Functional Servicing Report overlays the proposed peak sewage to be generated by the Estates of Glenway development on top of the predicted theoretical peak sewage flow from the R.V. Anderson Study to assess hydraulic impacts due to increased flow within the Western Sanitary Sub-Trunk.

   This analysis is discussed within **Section 6.3**.

3) **Existing Sanitary Flow Analysis – Downstream Flow Monitoring/Calibrated Model**

   This approach is based on an actual flow and rainfall monitoring program, whereby four flow monitors have been installed at key junction locations within the Western Sanitary Sub-Trunk, capturing actual flow data up to the Newmarket Sewage Pumping Station. The flow monitoring results will be calibrated using actual rainfall events recorded over the monitoring period. This monitoring program will be completed by the end of 2013.

   Once completed, this analysis will be presented and discussed within **Section 6.4**.

6.2. Existing Sanitary Flow Analysis – Local System Actual Flow Monitoring

In order to determine available sanitary sewer capacities within the existing system, Cole Engineering undertook a 6-month sanitary sewer flow monitoring program in the later half of 2010. The intent of the monitoring program was to correlate actual sanitary flows measured within the 450mm dia. sewer outletting from the Glenway Community at Peevers Ave. against the original theoretical sanitary design flows within the As Constructed Sanitary Sewer design sheet. The location selected for sanitary flow monitoring was within Ex. MH 110A, located to the northwest of Eagle Street and Yonge Street.

The findings of the monitoring program are described below.

6.2.1. Flow and Precipitation Monitoring

Sanitary flow and precipitation monitoring was completed from June 1st, 2010 to December 7, 2010 and all data collected is presented in **Appendix A.2**. Throughout the monitoring period, several large storms were captured including a 48 mm event on July 23, 2010 as well as several storms greater than 20 mm. The monitoring equipment used included redundant depth sensors and a velocity sensor that provided 100% data coverage for the duration of the monitoring period. Periodic maintenance visits were performed to confirm all sensors were working within normal parameters; no debris was built-up on the sensor and good sewer hydraulics was maintained.

6.2.2. Modeling and Data Analysis

Using the monitored precipitation and flow data in combination with existing and proposed land use conditions, the InfoWorks hydrodynamic model was prepared to assess flows within the existing sewer.

6.2.2.1 Rainfall and Flow Data Screening

Several high intensity rain events were selected for model calibration. **Table 6.1** summarizes the rainfall intensities and depths during the four (4) largest events which have wet weather flow response. **Figure 6-1** shows the Intensity-Duration-Frequency curves calculated for each of these events.

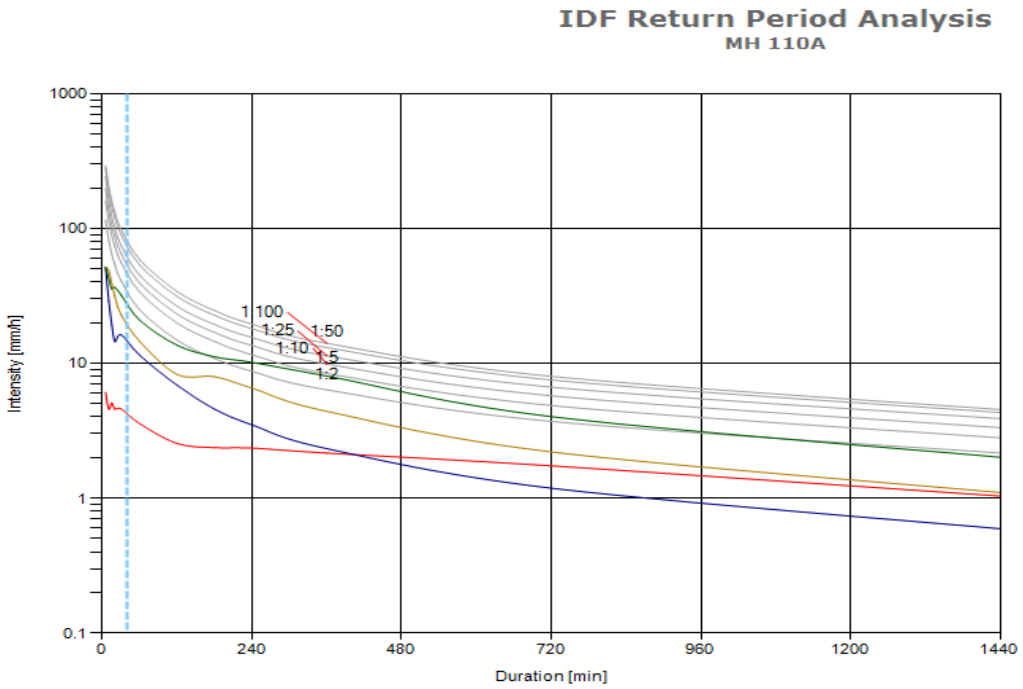
Table 6.1 – Rainfall Intensities and Volumes

Event	Event Date	Rainfall	
		Volume (mm)	Peak 5-min Intensity (mm/hr)
1	July 23, 2010	48	45.7
2	June 24, 2010	26	45.7
3	November 30, 2010	23	6.1
4	September 21, 2010	14	30.5

Table 6.2 summarizes the flows and wet-weather volumes after separating the dry-weather portion from the total measured hydrograph. The wet and dry weather flows were separated to quantify the extraneous flows entering the sewer during each storm event. The wet weather flow hydrograph separation for these flow gauges are illustrated in **Figure 6-2 to Figure 6-5.**

Table 6.2 – Wet Weather Flows and Volumes

Event	Date	Rainfall Volume (mm)	(L/s) (MH 110A)	Wet Weather Flow Volume (m3) (MH 110A)
1	July 23, 2010	48	13.3	248
2	June 24, 2010	26	13.9	205
3	November 30, 2010	23	9.5	151
4	September 21, 2010	14	4.4	31



Storm Return Period Over Time Of Concentration

Storm Date	Time of Concentration T_c (min)	Return Period over T_c
Nov 30, 2010	40	< 2 yr
Sep 21, 2010	40	< 2 yr
Jul 23, 2010	40	< 2 yr
Jun 24, 2010	40	< 2 yr

Site Information

Rain Gauge Location: RG Glenway Golf Course
Latitude: 44.050011
Longitude: -79.496216

Storm Date	Total Volume (mm)	Peak Intensity over Minute Timestep (mm/h)											
		5	10	15	20	30	60	120	180	240	360	720	1440
Nov 30, 2010	26	6.1	4.6	5.1	4.6	4.6	3.6	2.5	2.4	2.3	2.2	1.7	1
Sep 21, 2010	14	51.8	29	19.3	14.5	16.3	11.4	6.9	4.6	3.5	2.3	1.2	0.6
Jul 23, 2010	48	51.8	42.7	35.6	36.6	32	20.8	13.6	11.2	10.2	8	4	2
Jun 24, 2010	26	51.8	48.8	38.6	31.2	22.9	14.5	8.3	8	6.5	4.4	2.2	1.1

Export Peak Intensity Table

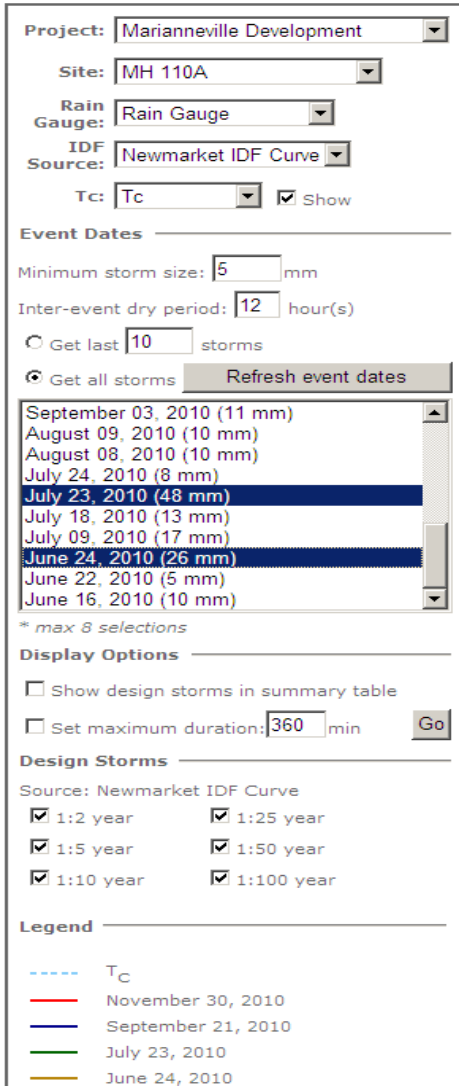


Figure 6-1 IDF Analysis-Largest Events Measured in Marianneville MH 110A during Monitoring Period

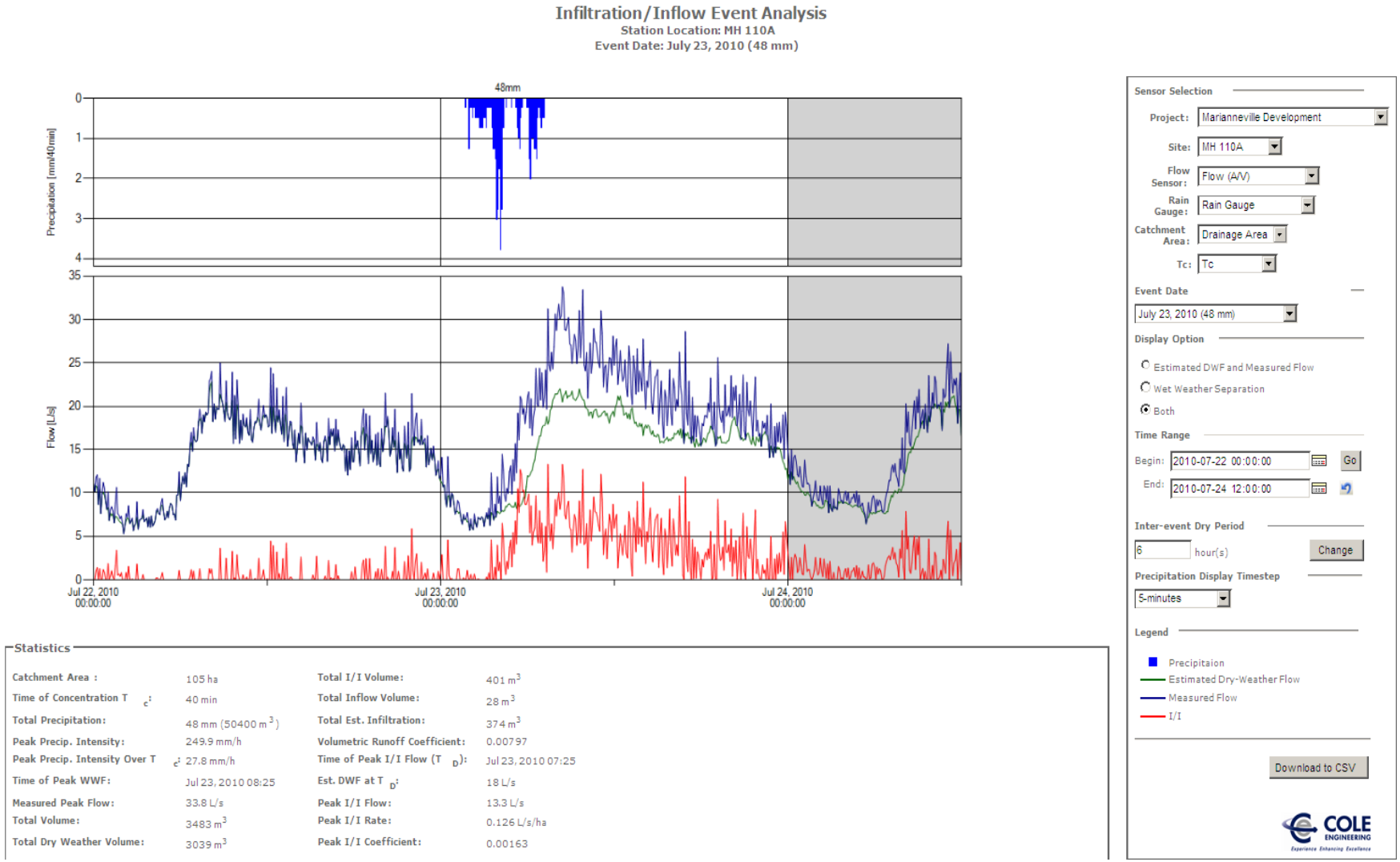


Figure 6-2 I/I Analysis of July 23 2010 Event

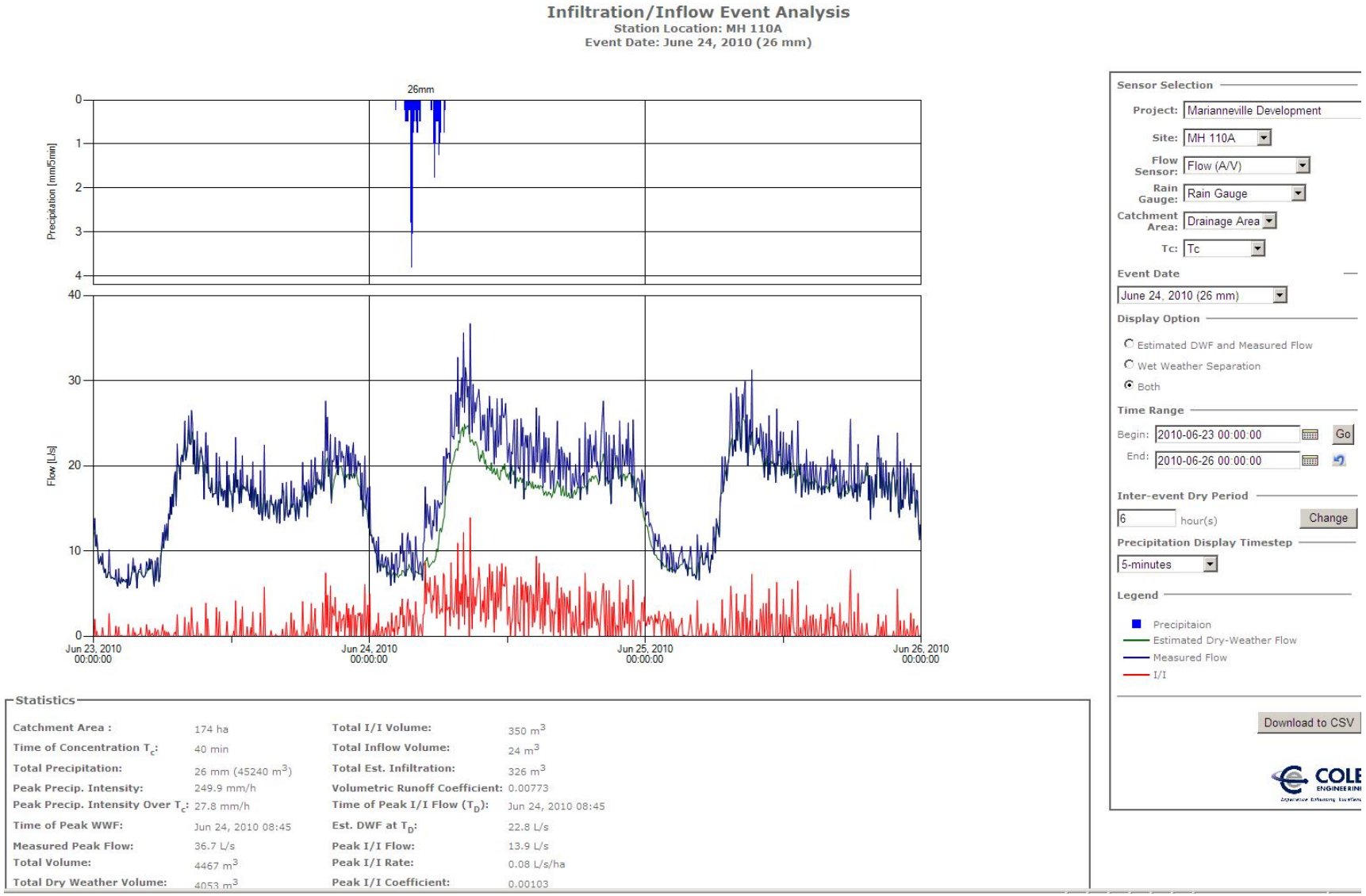


Figure 6-3 I/I Analysis of June 24 2010 Event

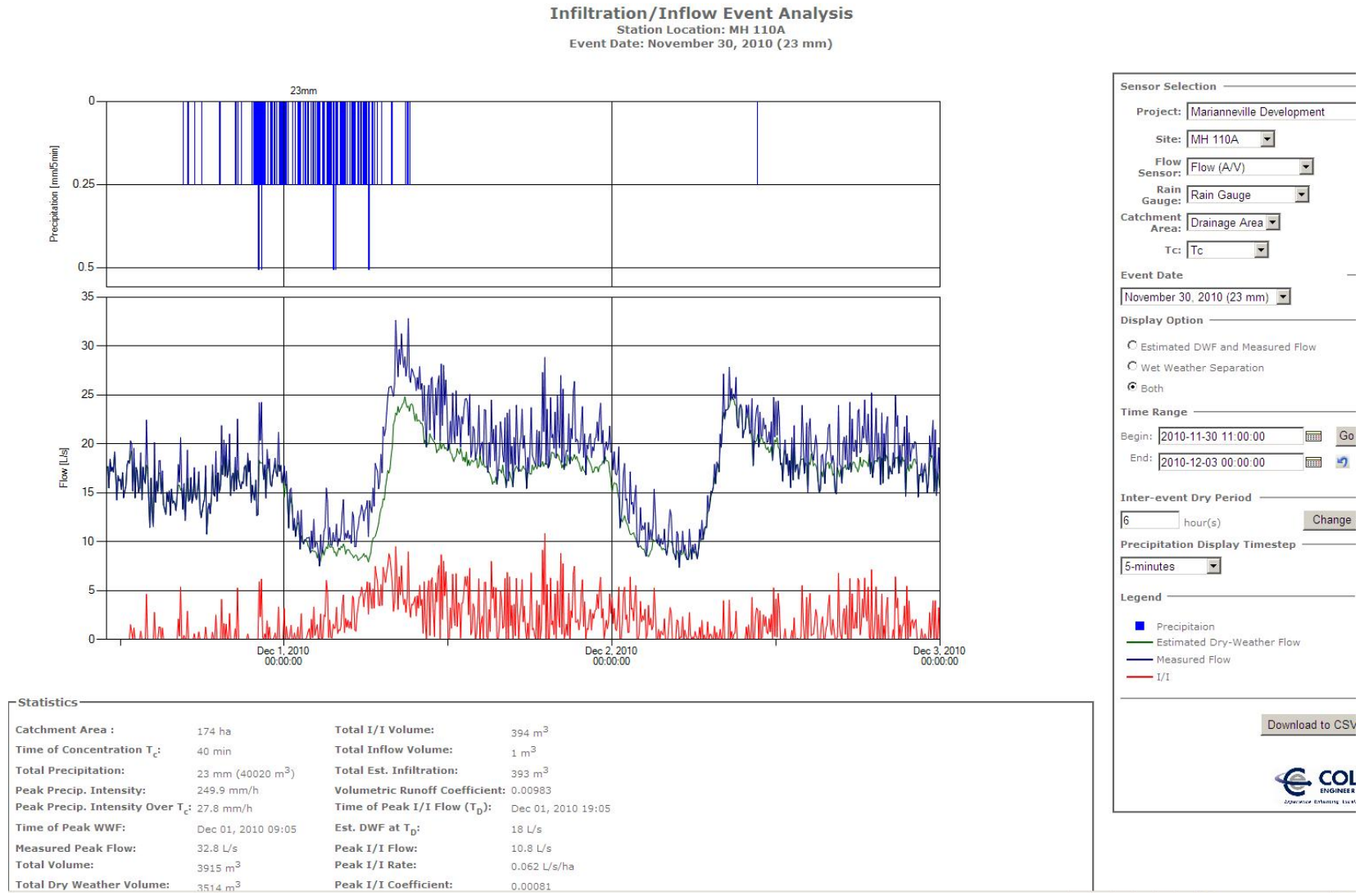


Figure 6-4 I/I Analysis of November 30 2010 Event

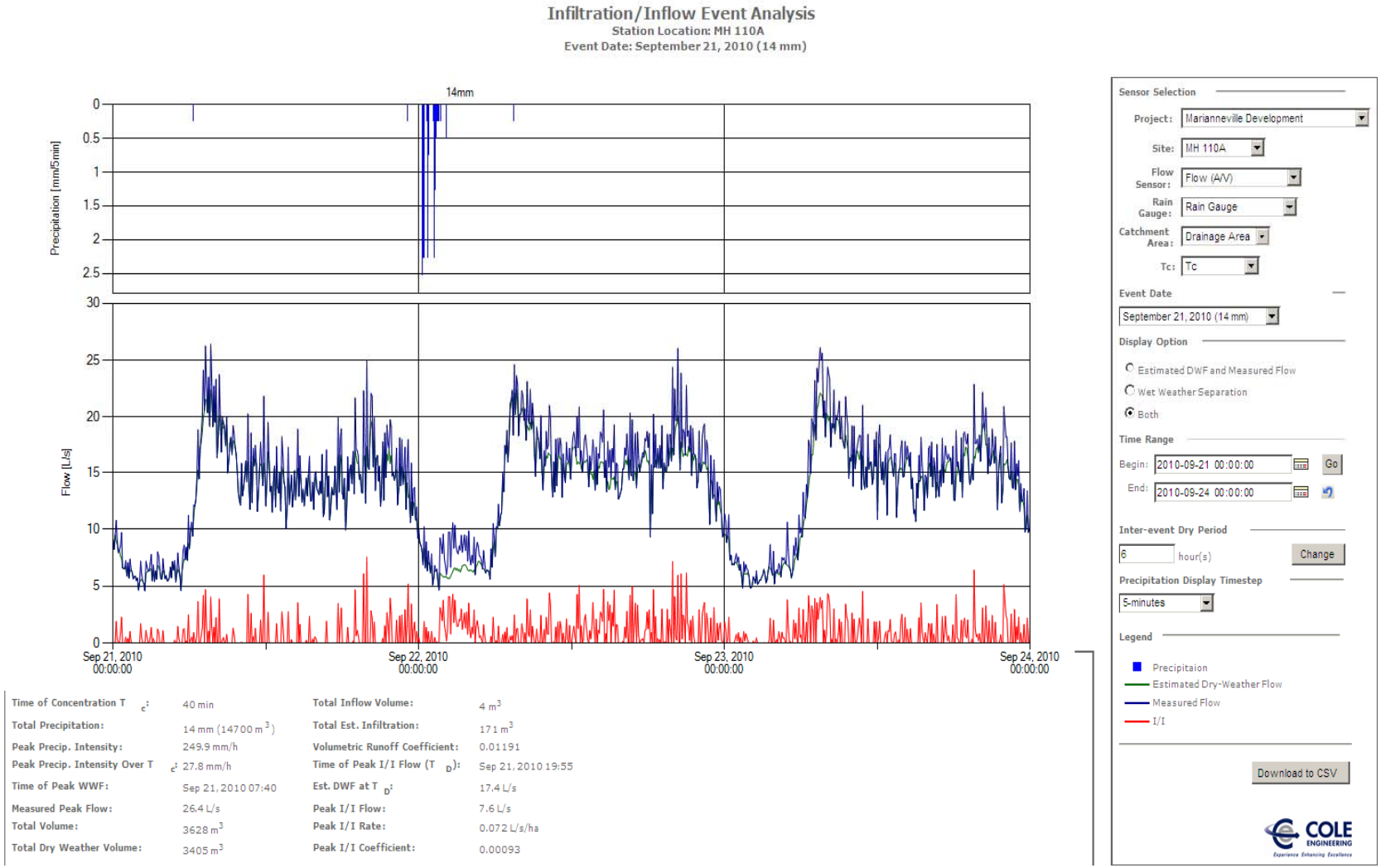


Figure 6-5 I/I Analysis of September 21 2010 Event

6.2.3. Existing Conditions Model Calibration

InfoWorks provides different methods to predict extraneous inflow or Rainfall-Derived-Infiltration and Inflow (RDII) into the system. The method selected for this study was the Ground Infiltration Model (GIM) since it is the standard currently used by the Region.

The GIM methodology uses numerous parameters to calibrate the model. **Table 6.3** summarizes the runoff surface parameters.

Table 6.4 summarizes the groundwater infiltration model parameters. **Table 6.5** describes the various GIM parameters.

Table 6.3 – Runoff Surface Parameters

Runoff Surface ID	Description	Runoff Routing Type	Runoff Routing Value	Initial Loss Type	Initial Loss Value (m)	Routing Model	Fixed Runoff Coefficient
1	Area 110A	Abs	0.13	Abs	0.005	SWMM	0.043

Table 6.4 – Groundwater Infiltration Model (GIM) Parameters

Ground Infiltration ID	Soil Depth (m)	Percolation Coefficient (day)	Baseflow Coefficient (day)	Infiltration Coefficient (day)	Percolation Threshold (%)	Percolation Percentage Infiltrating (%)	Porosity of Soil (%)	Porosity of Ground (%)	Initial Soil Depth (%)
MH110A	3	0.05	0.01	0.2	40	2	40	40	35

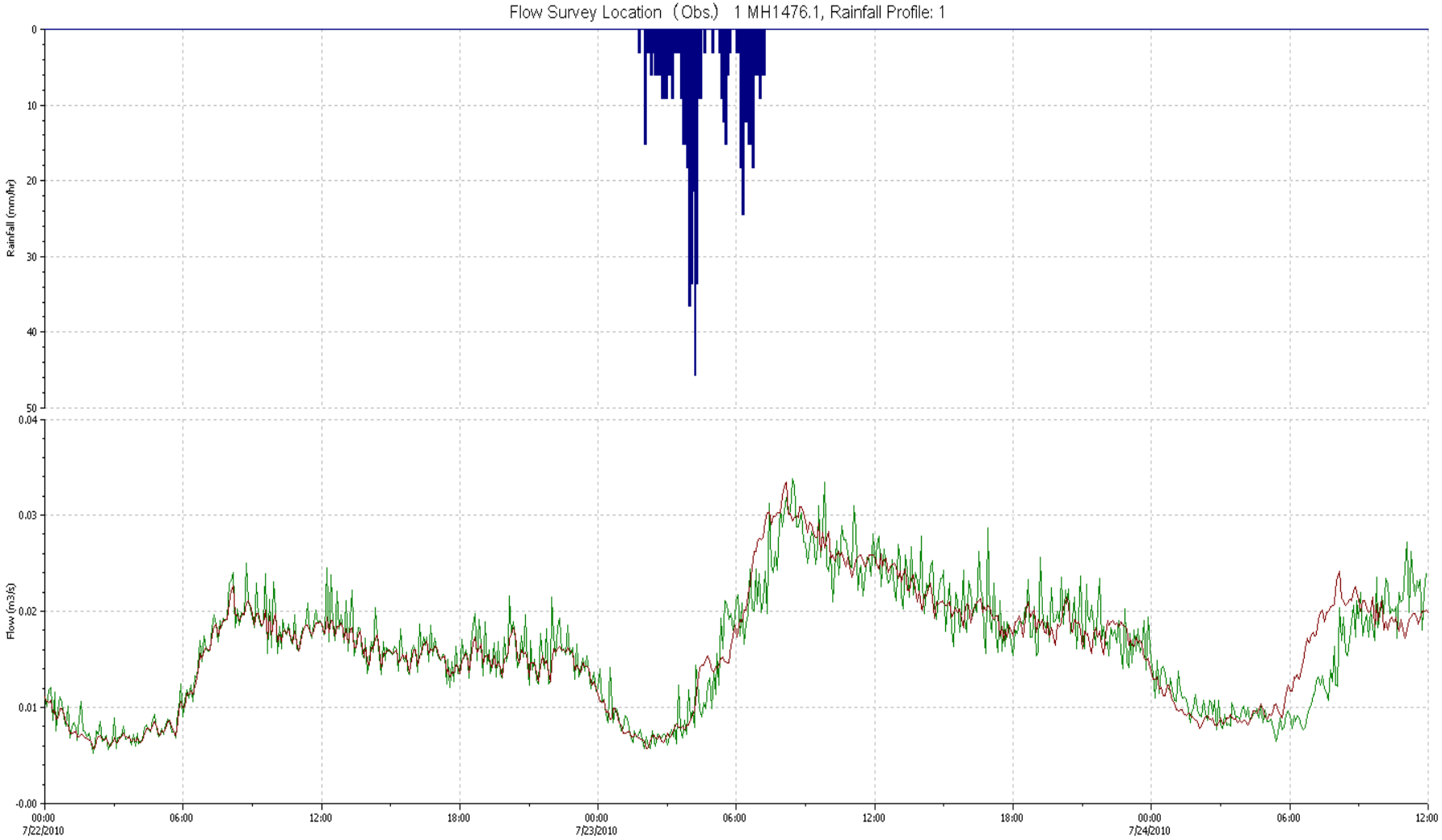
Table 6.5 – Description of GIM parameters

Parameter	Definition
Soil depth	Cover depth of pipe in meters
Percolation coefficient	Speed of contribution from soil storage reservoir in days
Baseflow coefficient	Speed of contribution to “Lost to groundwater” in days
Infiltration coefficient	Contribution from groundwater store to the sewer in days
Percolation threshold	% of water in soil depth at which there is a contribution from soil storage
Percolation percent infiltrating	% of flow goes into the sewer
Porosity of Soil	% of void spaces in unit volume of soil
Porosity of ground	% of void spaces
Initial soil depth	% of initial soil saturation

The results of the calibration are shown Figure 6-6 to **Figure 6-9** which highlight the measured and modelled hydrographs and measured hyetographs during the four (4) selected storms. **Table 6.6** summarizes the measured and modelled peak flows and volumes at the monitoring location at MH 110A.

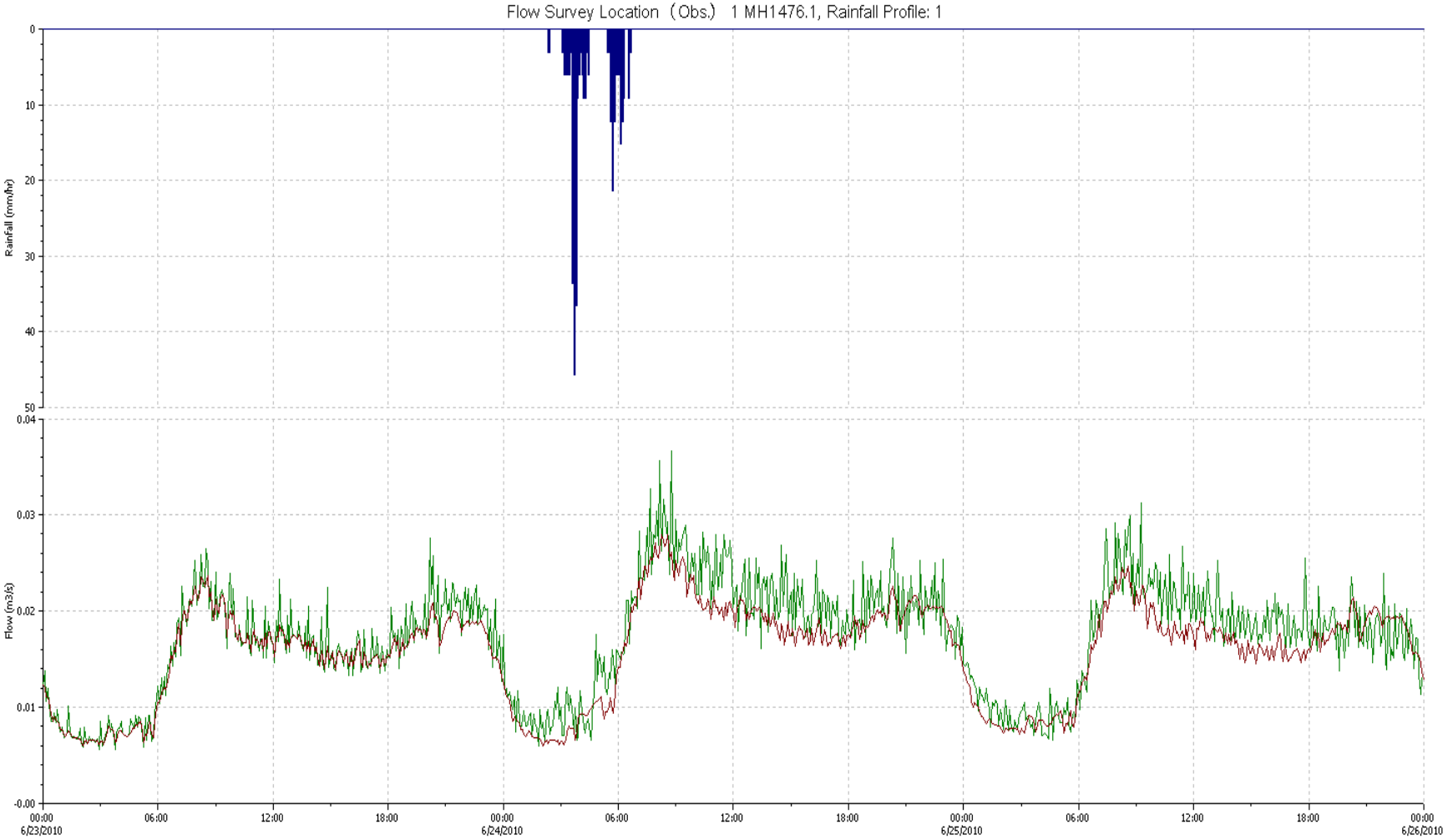
Table 6.6 – Measured versus Modelled Peak Flows and Volumes – Location MH 110A

Event	Event Date	Rainfall		Q-peak			Volume		
		Volume (mm)	Intensity (mm/hr)	Measured (m3/s)	Modeled (m3/s)	Difference (%)	Measured (m3)	Modeled (m3)	Difference (%)
1	July 23, 2010	48	45.7	0.034	0.031	0.0	3464	3457	-0.2
2	June 24, 2010	26	45.7	0.037	0.028	-9.7	4452	410.	-7.8
3	November 30, 2010	23	6.1	0.033	0.027	-6.9	3895	3826	-1.8
4	September 21, 2010	14	30.5	0.025	0.023	0.0	3615	3433	-4.9



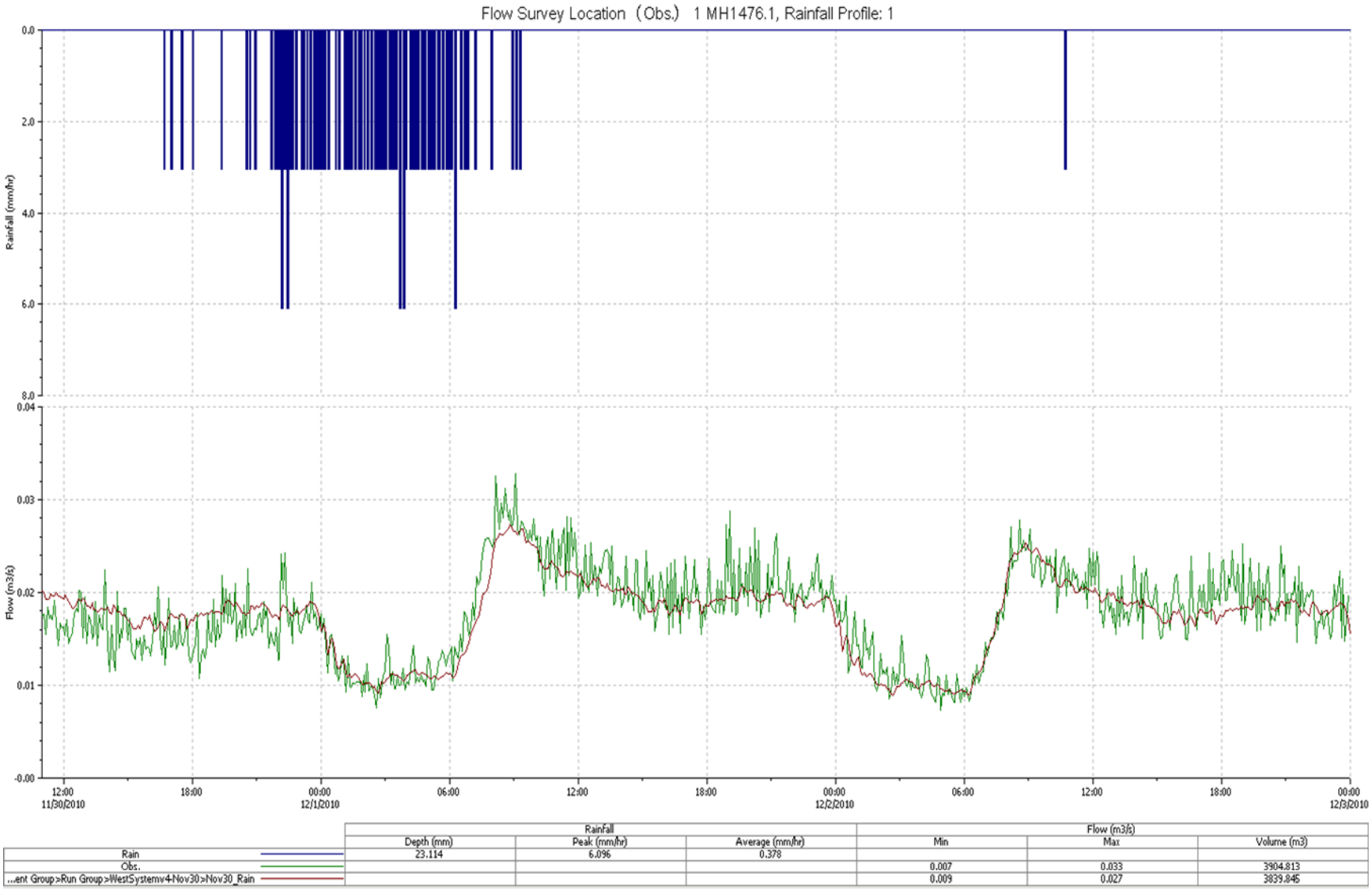
	Rainfall			Flow (m3/s)		
	Depth (mm)	Peak (mm/hr)	Average (mm/hr)	Min	Max	Volume (m3)
Rain	48.260	45.720	0.803			
Obs.				0.005	0.034	3472.849
...ment Group>Run Group>WestSystemv4-July23>Rain-July23				0.006	0.033	3482.050

Figure 6-6 Measured and Modeled Hydrograph Comparison, July 23, 2010 Event



	Rainfall			Flow (m3/s)		
	Depth (mm)	Peak (mm/hr)	Average (mm/hr)	Min	Max	Volume (m3)
Rain	26.416	45.720	0.366			
Obs.				0.006	0.037	4459.657
...ent Group:Run Group:WestSystemv4-June24:June24_Rain				0.006	0.028	4106.725

Figure 6-7 Measured and Modeled Hydrograph Comparison, June 24 2010 Event



	Rainfall			Flow (m3/s)		
	Depth (mm)	Peak (mm/hr)	Average (mm/hr)	Min	Max	Volume (m3)
Rain	23.114	6.096	0.378			
Obs.				0.007	0.033	3904.813
...ent Group>Run Group>WestSystemw4-Nov30>Nov30_Rain				0.009	0.027	3839.845

Figure 6-8 Measured and Modeled Hydrograph Comparison, November 30 2010 Event

	Rainfall			Flow (m3/s)		
	Depth (mm)	Peak (mm/hr)	Average (mm/hr)	Min	Max	Volume (m3)
Rain	14.478	30.480	0.201			
Obs.				0.005	0.026	3621.103
...ent Group>Run Group>WestSystemv4-Sept21>Sep21_Rain				0.005	0.023	3437.039

Figure 6-9 Measured and Modeled Hydrograph Comparison, September 21 2010 Event

6.2.4. Dry Weather Flow and I/I Rates Comparison

Once the model calibration was complete, the dry and wet weather flows were compared to existing standards. Population information was provided by the Town's H2OMap model and drainage areas were determined based on the drainage area plans and aerial photography. The existing population was estimated at 3,216 persons within the estimated drainage area shown in **Figure 6-10** along with the monitoring location (MH 110A). The infiltration rate identified in the monitoring program will be used for all future scenario modelling of existing background conditions.

Based on the summary of sanitary flow monitoring results, the average Dry Weather Flow in the system was monitored to be 386 L/cap/day, refer to the 2-page Sanitary Flow Analysis Report provided in **Appendix A.3**. This DWF was calculated by averaging the total flow from each dry weather day during the monitoring period. It should be noted that of the 386 L/cap/day it is estimated that only 272 L/cap/day is attributed to population derived flow. This estimation is based on standard industry practice assuming that 85% of the minimum daily flow is derived from groundwater infiltration. Based on a population of 3.216 upstream of the flow meter, the theoretical Harmon Peaking factor is 3.42. The measured Harmon Peaking factor over the 6-month monitoring period was 1.86, approximately 54.5% of the population based method.

The estimated wet weather flow was compared with previous reports and the existing standards and is summarized in **Table 6.7**. The current Town of Newmarket Design Standards provide for 0.30 L/s/ha of an extraneous flow rate that is not linked to a specific storm event. **Figure 6-11** shows a statistical analysis of the monitored I/I as compared to the Town's design events forecast for the 1:2 to 1:100 year design storms.

Table 6.7 – Comparison I/I with Previous Reports

Newmarket Design Storms	Flow Station MH 110A RDA Forecast I/I Rate (L/s/ha)	Calibrated Model Run Chicago - 24 hr Storms I/I Rate at MH 110A (L/s/ha)	Town of Newmarket - Assessment of Sanitary Sewer Design Flow Criteria (Giffels, 1995) I/I Rate (L/s/ha)	Town of Newmarket - Master Sanitary Sewer Hydraulic Study (R.V.Anderson, 2008) I/I Rate (L/s/ha)	YDSS Master Plan Update (2002) I/I Rate (L/s/ha) ***
2 Year Storm	0.15	0.08		0.22	
5 Year Storm	0.17	0.12		0.30	0.56
10 Year Storm	0.19	0.16		0.38	
25 Year Storm	0.20	0.25		0.46	0.72
50 Year Storm	0.23	0.35		0.51	
100 Year Storm	0.25	0.42	1.55	0.57	

Note: *** YDSS Master Plan Update (2002) recommended an allowance of 0.50 L/s/ha for peak I & I for all of Newmarket.

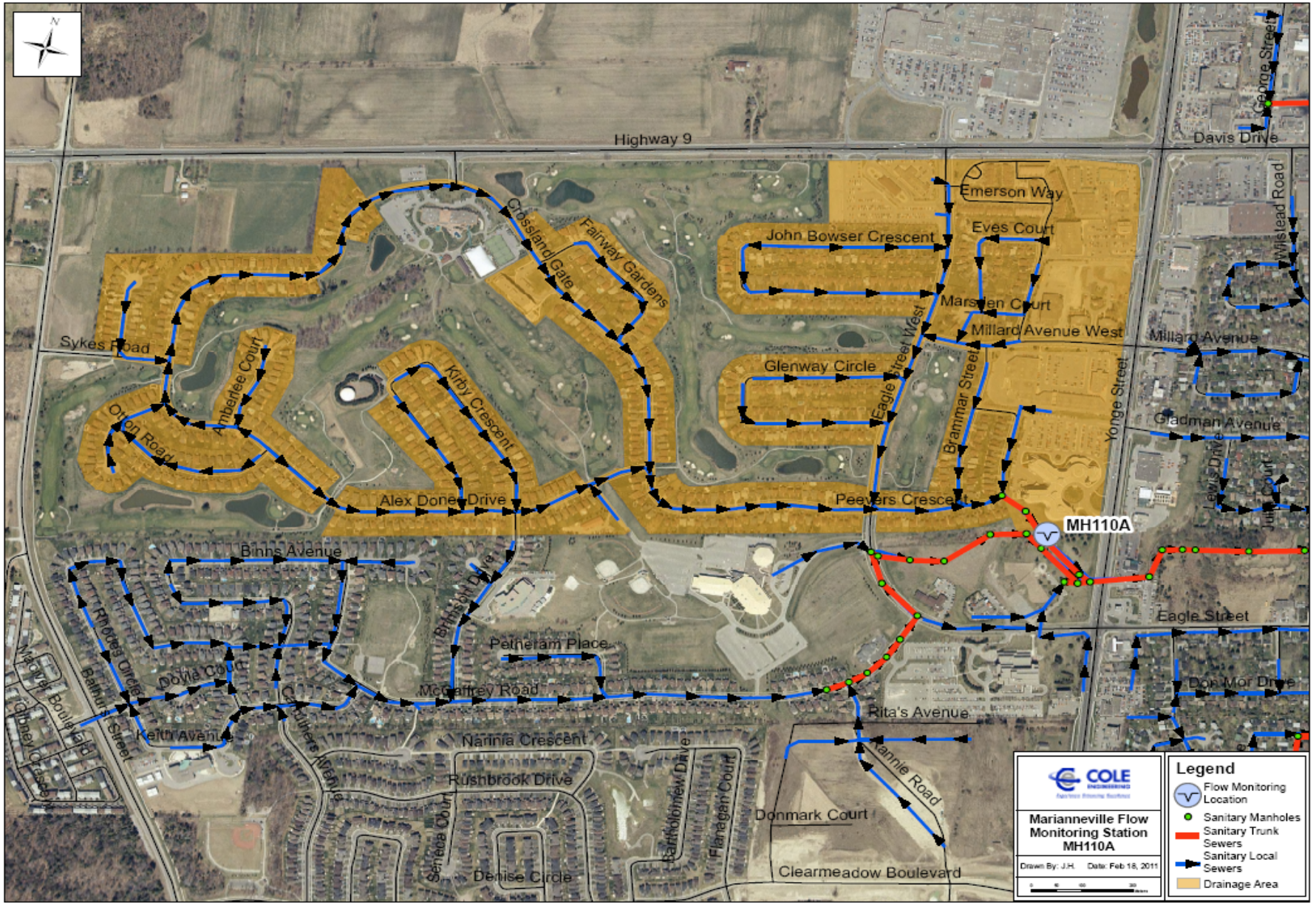


Figure 6-10 Flow Monitoring Station, Location and Drainage Area

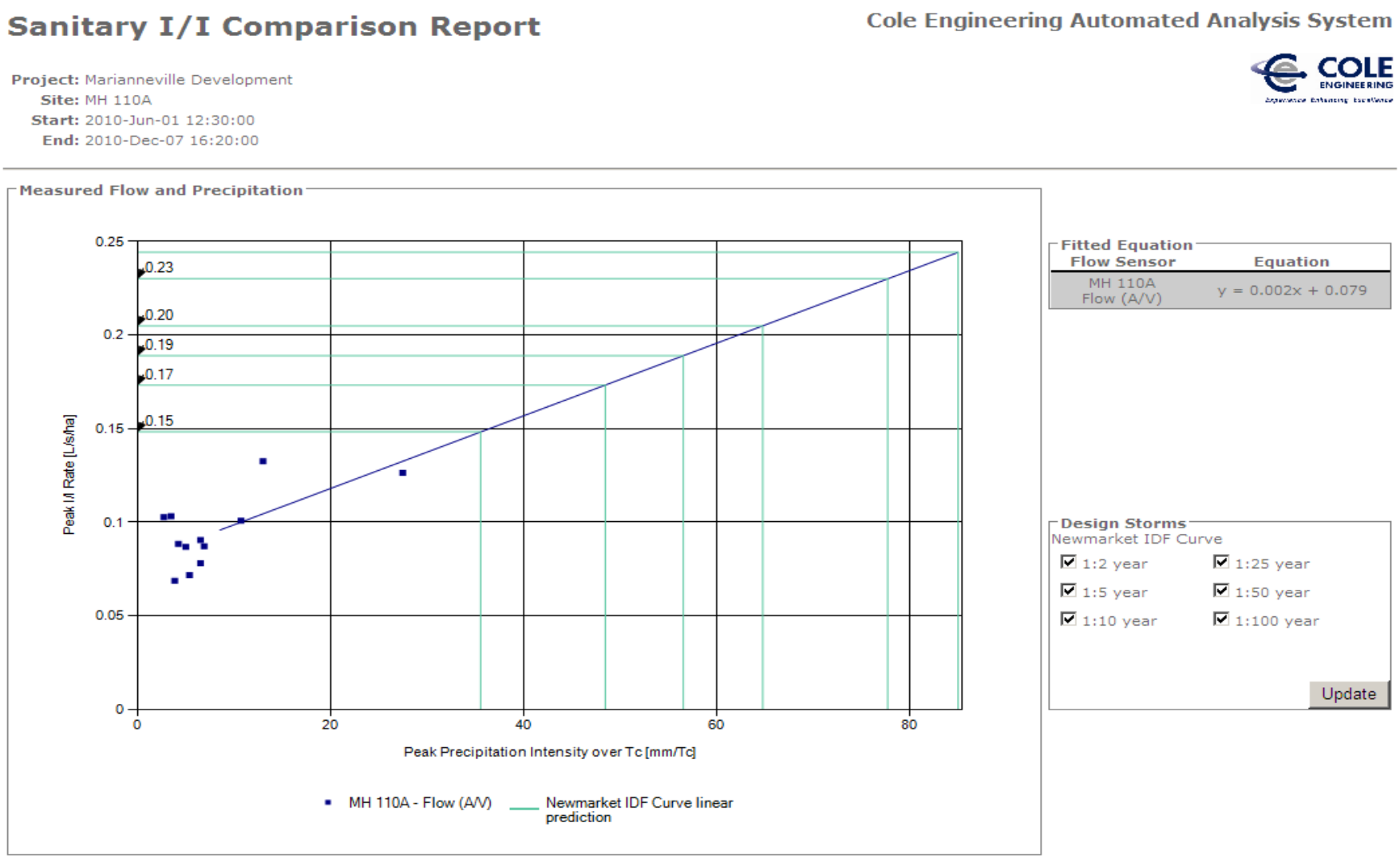


Figure 6-11 RDA Forecast I/I Rate for 2 to 100 Year Design Storm in Newmarket

6.2.5. Existing Sanitary Flow Monitoring and Model Results

Based on the data collected through the sanitary flow monitoring program, the existing peak sanitary flow rate is calibrated for Chicago 24 hr Storms (1:2 to 1:100 year events) and summarized in **Table 6.8.**

Table 6.8 – Existing Peak Sanitary Flows Generated During 2 to 100 Year Design Storms

Newmarket Design Storms	Existing Peak Sanitary Flow Condition Chicago 24 hr Storms (L/s)
2 Year Storm	28.9
5 Year Storm	33.2
10 Year Storm	36.6
25 Year Storm	46.0
50 Year Storm	55.5
100 Year Storm	61.9

For future sanitary flow analysis purposes, the most conservative storm event (100-year) and corresponding peak sanitary flow of 61.9 L/s shall be selected for comparison purposes under proposed development conditions.

6.3. Existing Sanitary Flow Analysis – Update to Downstream Theoretical Flow Model

R.V. Anderson and Associates completed a 'Master Sanitary Sewer Hydraulic Study', on behalf of the Town of Newmarket, final report dated May 2008. The analysis presented in the 2008 Study was based on the preparation of a theoretical model using the *InfoSewers* software to predict peak sanitary flow conditions within all sewer sheds throughout the Town. Included within this assessment was a capacity analysis of the Western Sub-Trunk sewer shed, which is the receiving sewer for flow generated by the proposed development, Estates of Glenway. The intent of the update to the R.V. Anderson theoretical model is to include peak sanitary flows (under 100-year storm wet weather conditions) from the proposed development and assess the impacts to the downstream sewer capacities and extent of surcharging, if any.

The first assessment was to confirm the functionality of the model received and confirm the input parameters, population and peak flows to ensure the model was operating and generating the same output as presented within the May 2008 Study. Following this assessment, the following parameters were utilized to generate the proposed sanitary flow conditions from the proposed development:

- Population = 1935
- Area = 30.44 ha
- Average Day Residential Flow Rate = 360L/cap/day : DWF = 8.06 L/s
- Inflow and Infiltration Rate = 0.3L/s/ha : I/I = 8.32 L/s
- Peak Sanitary Flow (at Pumping Station) = 27.3 L/s

Based on the inclusion of DWF and I/I rates totalling 16.38 L/s, the *InfoSewer* model generated an updated hydraulic grade line within the Western Sub-Trunk, refer to the output table below to assess the sewer capacity results from the May 2008 Study and the current update including proposed development flows:

Table 6.9 – Updated InfoSewer Model Output, Western Sub-Trunk Surcharging

Manhole ID	Pipe ID	Surcharge (m) (above sewer obvert)		Difference (m)	Freeboard (m) (surcharge distance below ground)	
		2008 Model	Proposed		2008 Model	Proposed
MH0267	SL0267	0.00	0.25	0.25	0.00	4.92
MH0268	SL0268	0.00	0.19	0.19	0.00	5.63
MH0279	SL0279	0.00	0.07	0.07	0.00	7.05
MH0280	SL0280	0.00	0.00	0.00	0.00	0.00
MH0281	SL0281A	0.24	0.34	0.11	6.90	6.80
MH0284	SL0284	0.00	0.29	0.29	0.00	3.76
MH0285	SL0285	0.04	0.43	0.39	3.95	3.56
MH0318	SL0318	0.00	0.38	0.38	0.00	5.67
MH0400	SL0400	0.24	0.40	0.17	3.53	3.37
MH0401	SL0401	0.17	0.26	0.10	1.92	1.83
MH0402	SL0402	0.14	0.19	0.05	2.23	2.18
MH0403	SL0403	0.00	0.00	0.00	0.00	0.00
MH0404	**SL0404**	**0.17**	**0.44**	**0.27**	**1.74**	**1.47**
MH0405	SL0405	0.34	0.55	0.22	3.10	2.88
MH0406	SL0406	0.24	0.36	0.12	2.37	2.25
MH0406A	SL0406A	0.15	0.23	0.08	2.17	2.09
MH0407	SL0407	0.00	0.00	0.00	0.00	0.00
MH0408	SL0408	0.00	0.00	0.00	0.00	0.00
MH0409	SL0409	0.00	0.00	0.00	0.00	0.00
MH0410	**SL0410**	**0.30**	**0.62**	**0.32**	**2.04**	**1.72**
MH0665	SL0665	0.67	0.89	0.23	2.55	2.32
MH0666	SL0666	0.58	0.76	0.18	2.01	1.83
MH0667	**SL0667**	**0.13**	**0.18**	**0.05**	**0.78**	**0.73**
MH0668	SL0668	0.09	0.12	0.03	3.84	3.81
MH0669	SL0669	0.00	0.00	0.00	0.00	0.00
MH0670	**SL0670**	**0.00**	**0.60**	**0.60**	**0.00**	**1.41**
MH0670A	SL0670A	0.08	0.51	0.42	2.31	1.88
MH0694	SL0694	0.00	0.37	0.37	0.00	2.17
MH0703	**SL0703**	**0.16**	**0.24**	**0.08**	**1.73**	**1.65**
MH0703A	**SL0703A**	**0.24**	**0.35**	**0.11**	**1.56**	**1.44**
MH0704	SL0704	0.13	0.18	0.05	2.45	2.40
MH0705	SL0705	0.14	0.18	0.04	2.57	2.53
MH0716	SL0716	0.00	0.00	0.00	0.00	0.00
MH0717	SL0717	0.00	0.00	0.00	0.00	0.00
MH0718	SL0718	0.00	0.05	0.05	0.00	2.41

Manhole ID	Pipe ID	Surcharge (m) (above sewer obvert)		Difference (m)	Freeboard (m) (surcharge distance below ground)	
		2008 Model	Proposed		2008 Model	Proposed
MH0724	SL0724	0.11	0.20	0.09	2.07	1.98
MH1474	SL1474	0.00	0.00	0.00	0.00	0.00
MH1475	SL1475	0.00	0.00	0.00	0.00	0.00
MH1476	SL1476	0.00	0.00	0.00	0.00	0.00
MH1477	SL1477	0.00	0.00	0.00	0.00	0.00
MH1477A	SL1477A	0.00	0.08	0.08	0.00	8.60
MH1477B	SL1477B	0.00	0.00	0.00	0.00	0.00
MH1477C	SL1477C	0.00	0.00	0.00	0.00	0.00
MH1477D	SL1477D	0.00	0.00	0.00	0.00	0.00
MH1477E	SL1477E	0.00	0.00	0.00	0.00	0.00
MH1477F	SL1477F	0.00	0.00	0.00	0.00	0.00
MH1477G	SL1477G	0.00	0.00	0.00	0.00	0.00
MH1478	SL1478	0.00	0.00	0.00	0.00	0.00
MH2805	SL2805	0.00	0.03	0.03	0.00	6.68
MH2806	SL2806	0.44	0.64	0.20	7.30	7.10
MHTRANS	**SL0410A**	**0.57**	**0.88**	**0.31**	**2.03**	**1.72**
YR-77-01	YR-1932	0.00	0.00	0.00	0.00	0.00
YR-77-NMSS	SL_OUTLET	0.00	0.00	0.00	0.00	0.00
YR-EHRT-118BP	YR-1659	0.00	0.00	0.00	0.00	0.00
YR-WHRT-02	YR-1329	0.00	0.00	0.00	0.00	0.00
YR-WHRT-03	YR-1328	0.00	0.00	0.00	0.00	0.00
YR-WHRT-04	YR-1327	0.00	0.02	0.02	0.00	2.19
YR-WHRT-05	YR-1312	0.03	0.04	0.01	2.47	2.46
YR-WHRT-06	YR-1301	0.00	0.00	0.00	0.00	0.00
YR-WHRT-07	YR-1302	0.00	0.00	0.00	0.00	0.00
YR-WHRT-08	YR-1303	0.00	0.00	0.00	0.00	0.00
YR-WHRT-09	YR-1311	0.00	0.00	0.00	0.00	0.00
YR-WHRT-10	YR-1310	0.00	0.01	0.01	0.00	2.62
YR-WHRT-11	YR-1309	0.17	0.27	0.10	2.34	2.24
YR-WHRT-12	YR-1308	0.16	0.25	0.09	2.31	2.22
YR-WHRT-13	YR-1307	0.12	0.19	0.07	2.46	2.38
YR-WHRT-14	YR-1306	0.38	0.44	0.06	3.79	3.73
YR-WHRT-15	YR-1305	0.00	0.00	0.00	0.00	0.00
YR-WHRT-16	YR-1304	0.00	0.00	0.00	0.00	0.00
YR-WHRT-17	YR-1655	0.00	0.00	0.00	0.00	0.00

The results of the updated *InfoSewers* model indicate that seven sewer sections of the Western Sub-Trunk will experience surcharging where the hydraulic grade line will be within the 1.80m vertical freeboard distance to ground surface (typically regarded as the standard depth of basement elevation below centerline of road). The seven sewer sections are highlighted within the above table and discussed below.

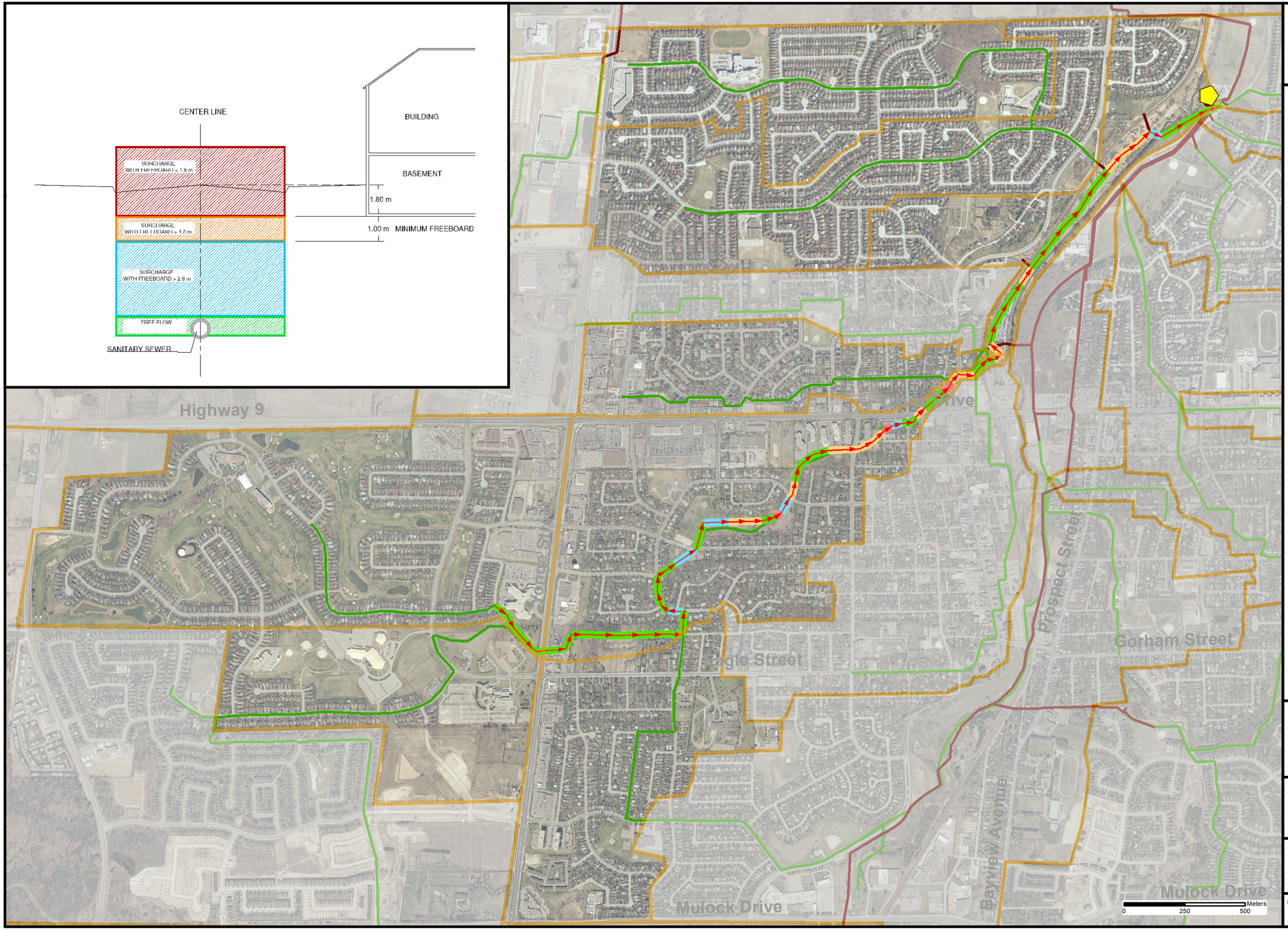
- Pipe ID: SL0404, Proposed Freeboard = 1.47m
    - This section of sewer is situated within Hasket Park and does not receive house connections directly to the sewer.
- Pipe ID: SL0410 and SL0410A, Proposed Freeboard = 1.72m
    - This section of sewer is situated along Calgain Road and does not receive house connections directly to the sewer. It should be investigated if the existing apartment buildings on the north side of Calgain Rd. are directly connected to this sewer.
- Pipe ID: SL0667, Proposed Freeboard = 0.73m
    - This section of sewer is situated along the rear of an existing commercial strip mall fronting Davis Drive, between Lorne Ave. and Niagara St. and does not receive house connections directly to the sewer.
- Pipe ID: SL0670, Proposed Freeboard = 1.41m
    - This section of sewer is situated along the southeast corner of Davis Drive and Niagara St. adjacent to an existing watercourse. It should be investigated if the existing houses to the south are connected directly to the sewer.
- Pipe ID: SL0703 & SL0703A, Proposed Freeboard = 1.65m and 1.44m
    - This section of sewer crosses Charlotte St. N, just northwest of Davis Drive and Main St. N. following the existing watercourse. It should be investigated if the existing houses directly to the west are connected to the sewer.

Based on the 100-year storm condition, the overall Western Sub-Trunk plan view of the original R.V. Anderson (May 2008 Study) sewer surcharging condition and the proposed sewer surcharging condition (with Estates of Glenway development) are shown on **Figure 6-12** and **Figure 6-13**, respectively. The Figures are color-coded to indicate which sections of sewers operate under free flow or surcharged conditions. The plan and profile view of the overall Western Sub-Trunk, including predicted level of theoretical surcharging are shown on **Figure 6-14** to **Figure 6-17**.

The sanitary flow from the proposed development increases the predicted surcharging within the Western Sub-Trunk, however it does not appear that house connections (basements) will be affected due to the increased hydraulic grade line (and reduced freeboard) from the sewer. Certain locations require investigation to confirm if residential connections exist along the Western Sub-Trunk. The updated *InfoSewer* model is not included as part of this Report, but is available upon request.

6.4. Existing Sanitary Flow Analysis – Downstream Flow Monitoring/Calibrated Model

At the time of Functional Servicing Report submission (November 2013) the sanitary monitoring of the Western Sanitary Sub-Trunk was ongoing. The results, analysis, discussion and recommendations will be completed through a separate submission to be ultimately appended to this Report.



Legend

- Pumping Station
- YDSS
- Subtrunk
- Free Flow
- Freeboard > 2.8 m
- Freeboard > 1.8 m
- Freeboard < 1.8 m
- Sewershed Boundary

Current Scenario
100-Year Storm

R.V.A. 2008 Master Plan Model

Project:
Marianneville Developments Ltd.
Estates of Glenway Newmarket
Town of Newmarket

COLE ENGINEERING

Project No.: **L09-301**

Fig No.: **6.12**

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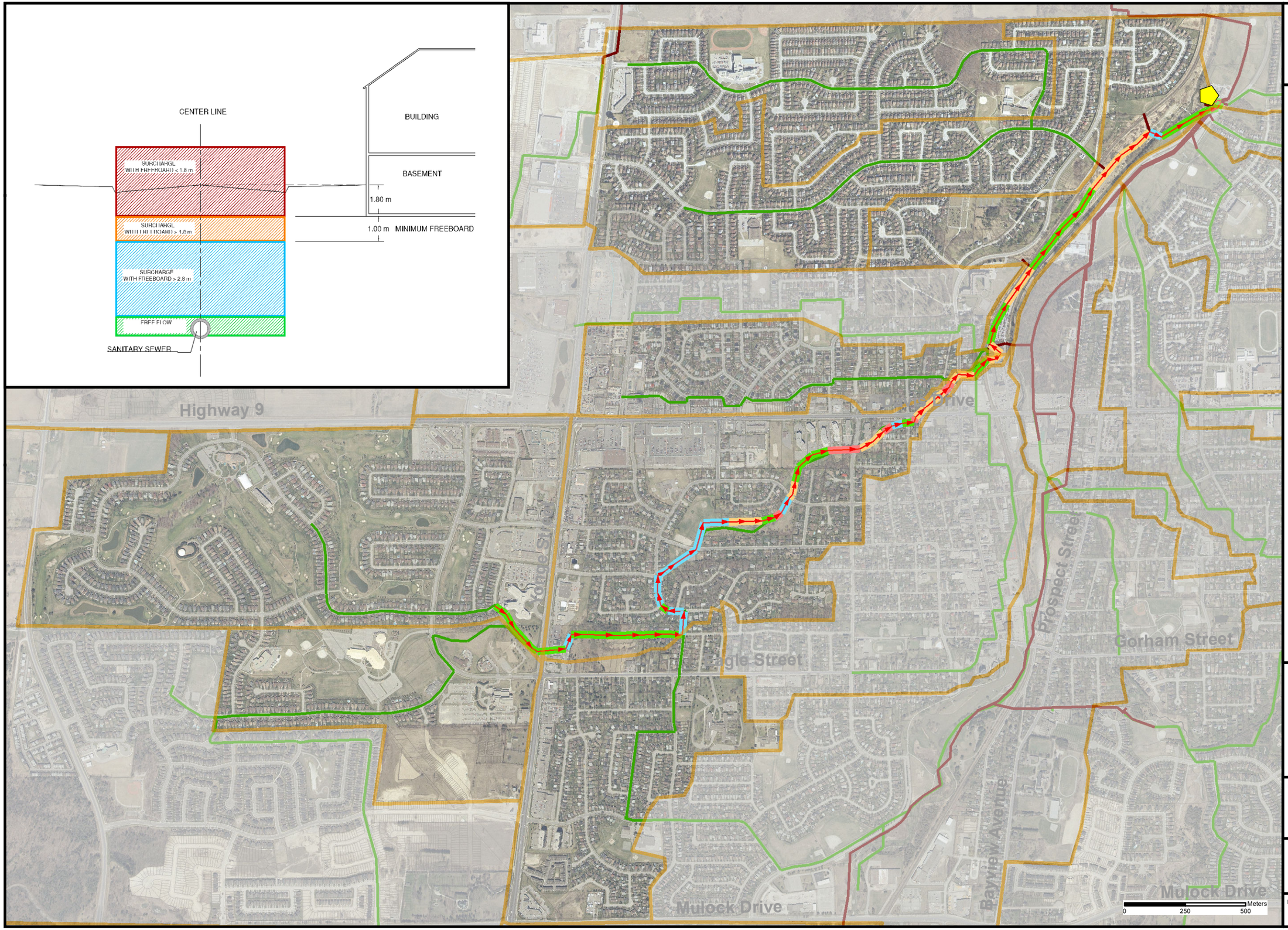

Legend

- Pumping Station
- YDSS
- Subtrunk
- Free Flow
- Freeboard > 2.8 m
- Freeboard > 1.8 m
- Freeboard < 1.8 m
- Sewershed Boundary

Current Scenario + Proposed Development 100-Year Storm

New Development Added to R.V.A. 2008 Master Plan Model

Project:
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Estates of Glenway Newmarket
Town of Newmarket

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Project No.: **L09-301**

Fig No.: **6.13**

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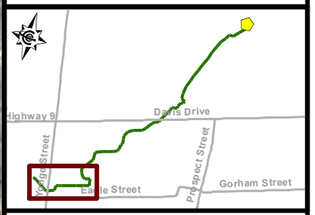
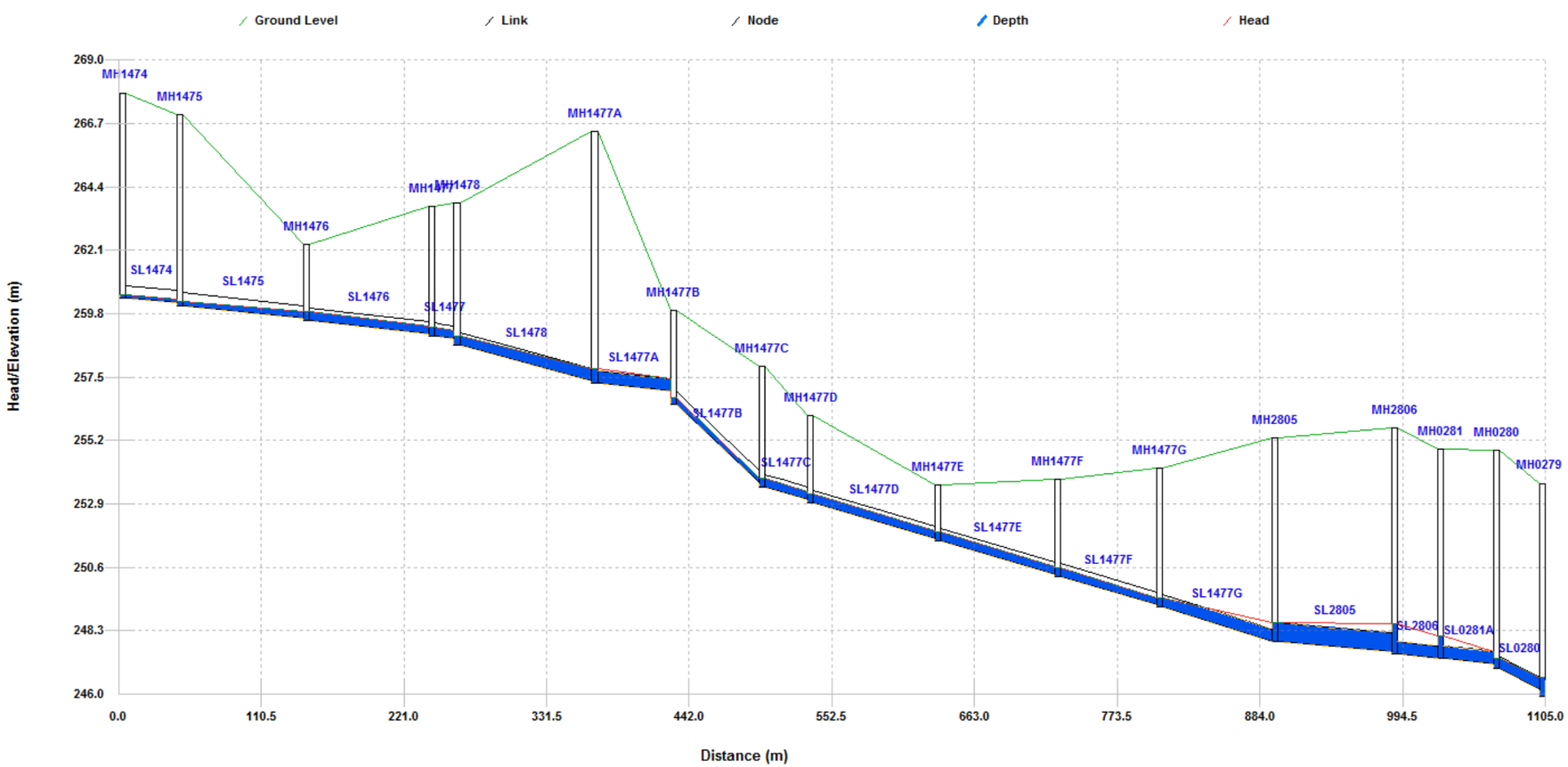


Legend

- Pumping Station
- YDSS
- Subtrunk
- Free Flow
- Freeboard > 2.8 m
- Freeboard > 1.8 m
- Freeboard < 1.8 m



Current Scenario + Proposed Development 100-Year Storm

New Development Added to R.V.A. 2008 Master Plan Model

Project:
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Estates of Glenway Newmarket
Town of Newmarket

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Project No.: L09-301

Fig No.: 6.14

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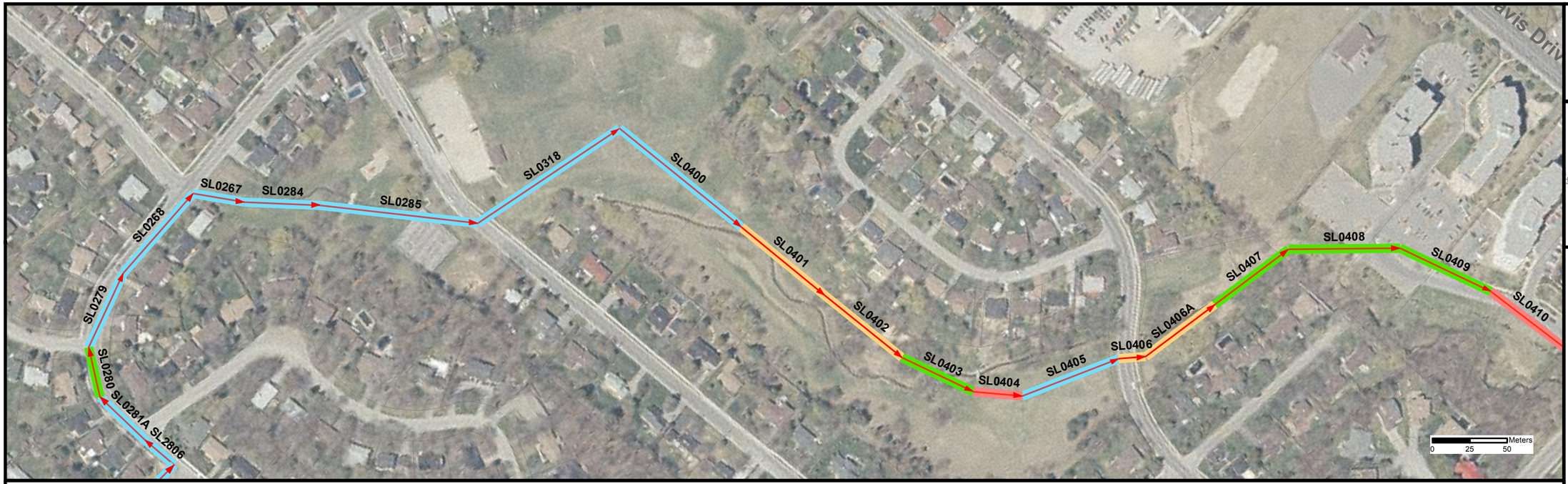
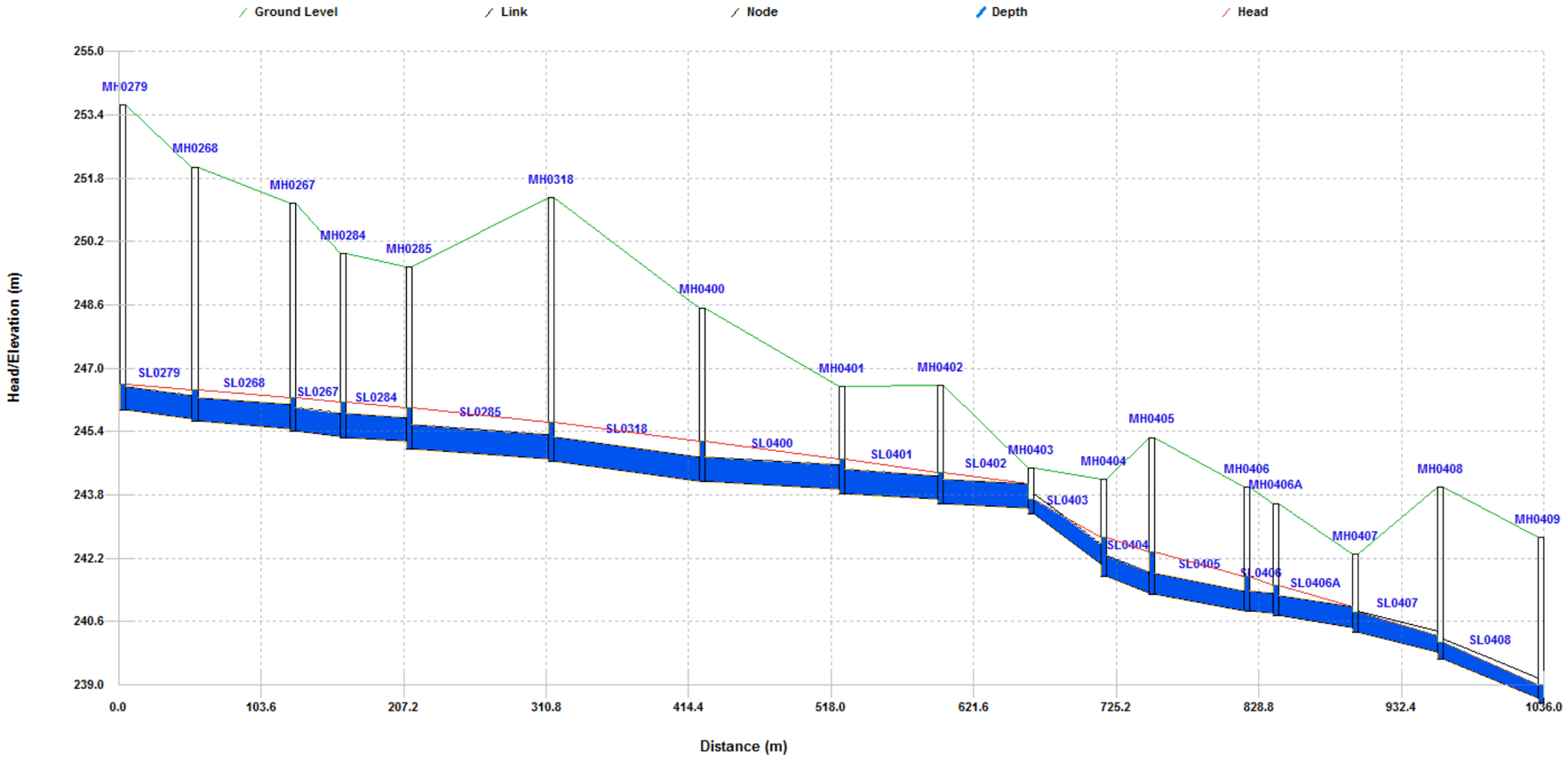


Legend

- Pumping Station
- YDSS
- Subtrunk
- Free Flow
- Freeboard > 2.8 m
- Freeboard > 1.8 m
- Freeboard < 1.8 m



Current Scenario + Proposed Development 100-Year Storm

New Development Added to R.V.A. 2008 Master Plan Model

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Project No.:	Fig No.:
L09-301	6.15

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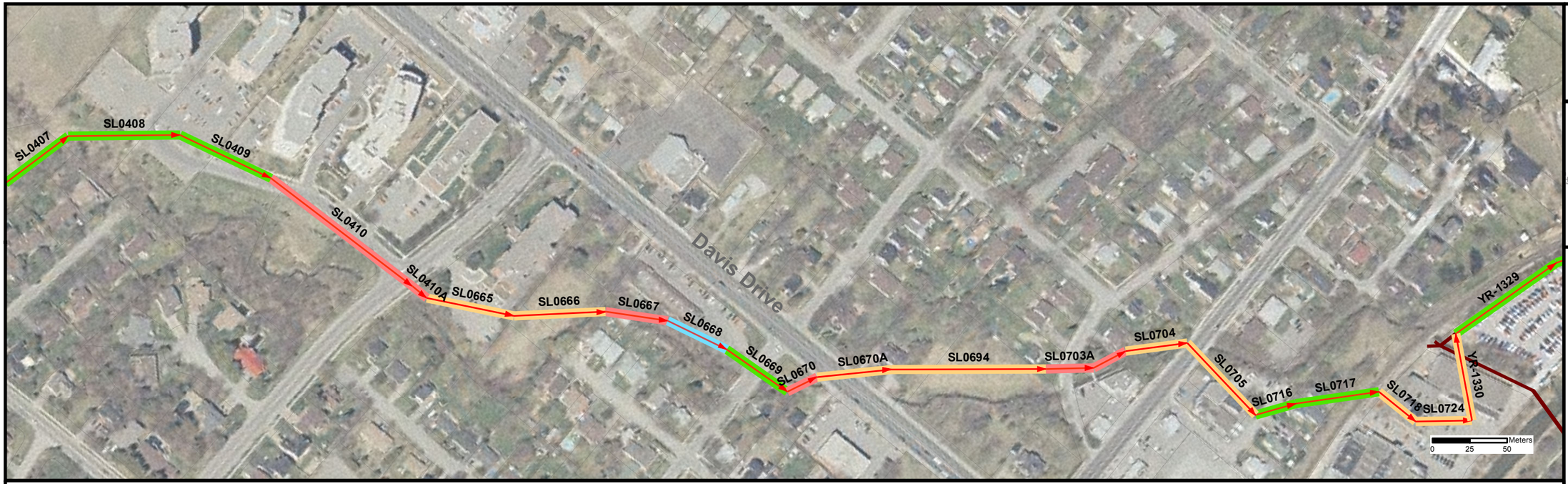
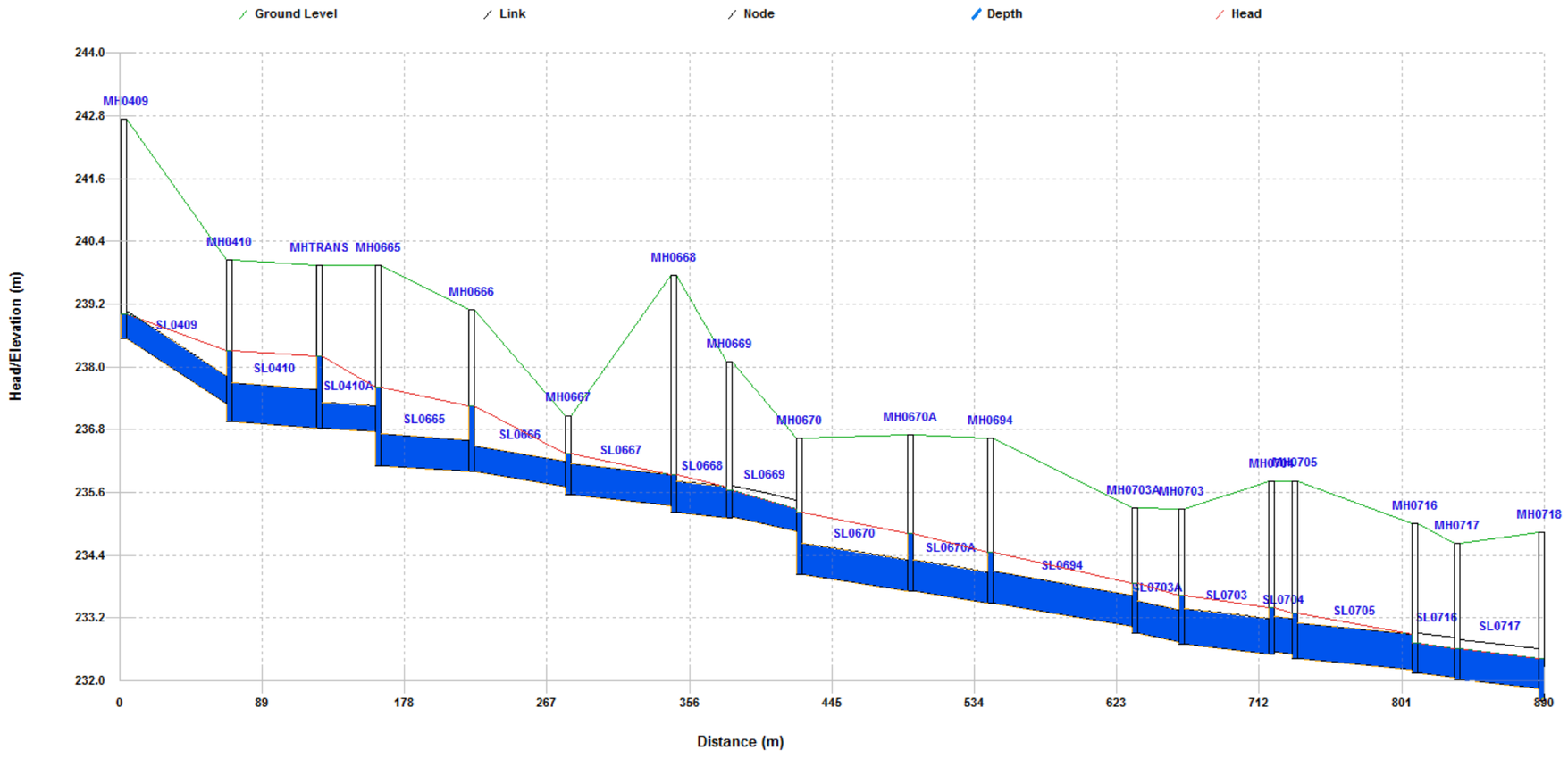


Legend

- Pumping Station
- YDSS
- Subtrunk
- Free Flow
- Freeboard > 2.8 m
- Freeboard > 1.8 m
- Freeboard < 1.8 m



Current Scenario + Proposed Development 100-Year Storm

New Development Added to R.V.A. 2008 Master Plan Model

Project:
Marianneville Developments Ltd.
Estates of Glenway Newmarket
Town of Newmarket

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Project No.:	Fig No.:
L09-301	6.16

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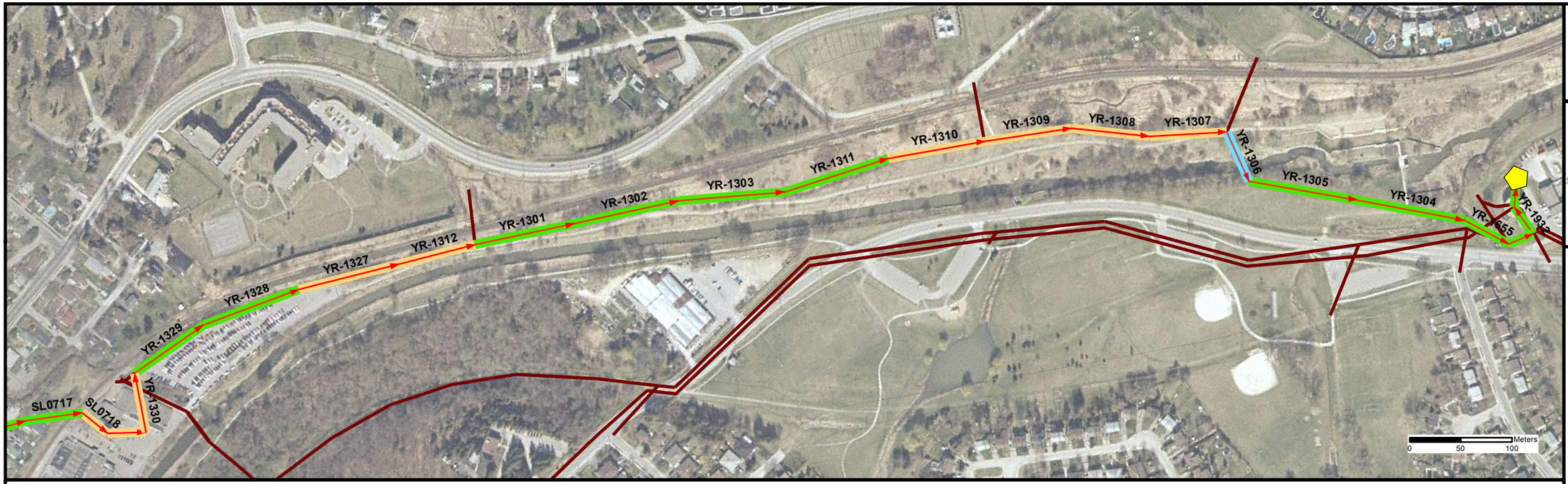
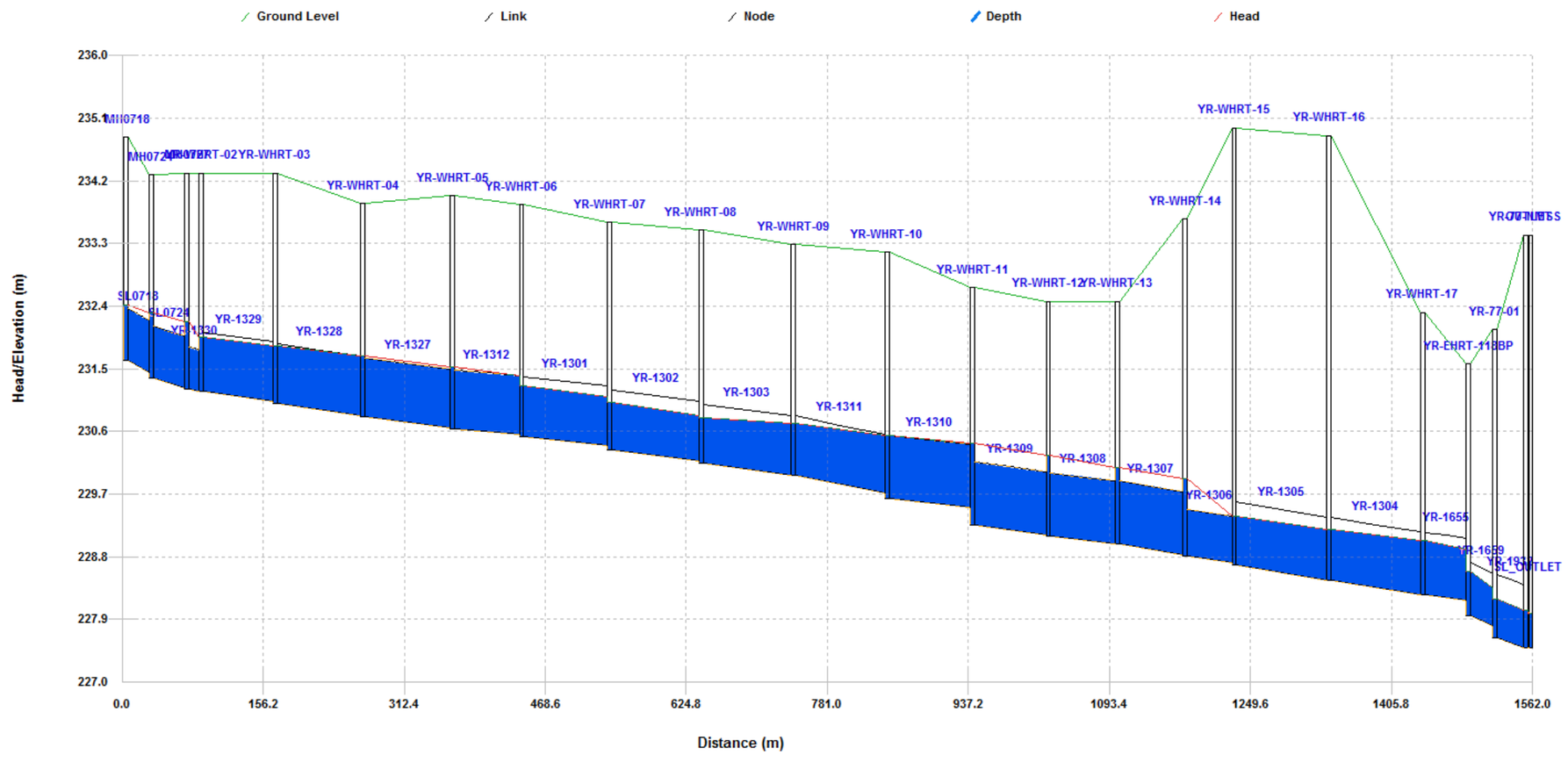


Legend

- Pumping Station
- YDSS
- Subtrunk
- Free Flow
- Freeboard > 2.8 m
- Freeboard > 1.8 m
- Freeboard < 1.8 m



Current Scenario + Proposed Development 100-Year Storm

New Development Added to R.V.A. 2008 Master Plan Model

Project:
Marianneville Developments Ltd.
Estates of Glenway Newmarket
Town of Newmarket

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Project No.:	Fig No.:
L09-301	6.17

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6.5. Newmarket Sewage Pumping Station

The Newmarket Pumping Station is located at 360 Bayview Parkway and receives flow from approximately half of the populated drainage area of the Town of Newmarket. The East and West Holland Regional trunks are currently the main contributors of flow to the pumping station. There is also a small proportion of area of East Gwillimbury currently connected with the Holland Landing/ Queensville / Sharon services area proposed for temporary connection until the Upper York Sewage Solution (UYSS) is in operation.

As per the Certificate of Approval (3049-8GCRAJ) dated May 2, 2011, the Newmarket Pumping Station consists of four (4) vertical centrifugal dry pit pumps and has a peak pumping capacity of 1,290 L/s. The pumping station also has additional wet weather flow protection in the form of a 10,000m^3 underground equalization tank. The equalization tank is utilized during periods of heavy rainfall or snowmelt to reduce the peak flow rate at the PS and to reduce the risk of overflow to the environment.

The Newmarket Sewage Pumping Station is owned and operated by the Region of York. In 2008, the Town of Newmarket utilized the recorded flow measurements from the Newmarket Pumping Station to complete a Sanitary Sewer Master Plan, prepared by R.V. Anderson & Associates, May 2008. The objective was to assess the performance of the Town's sanitary sub-trunks after the September 13, 2006 storm event. The September 13, 2006 storm event was measured at 1:100 year return period and the records at the pumping station show that no overflow occurred. This would indicate the pumping station was adequately sized to receive the wet weather flow generated. At the time of the September 13, 2006 storm event, the pumping station was rated at 1,190 L/s capacity and did not have the added protection of the equalization tank, which was subsequently constructed between 2007 to 2009.

Based on the R.V. Anderson Sanitary Sewer Master Plan, Table 5-2, May 2008, the total theoretical peak flow, under wet weather flow conditions, at the Newmarket Pumping Station is 1,423 L/s. The Western Sub-Trunk contributed 701.9 L/s of the total peak flow amount. Based on the updated theoretical sanitary flow modeling discussed under **Section 6.3** above, the proposed development contributes an additional peak flow rate of 27.3 L/s at the Newmarket Sewage Pumping Station or a theoretical increase of 4% in peak flow rates from the Western Sub-Trunk.

6.6. Proposed Sanitary Sewers

The proposed development within the former Glenway Country Club will utilize connections to the existing surrounding sanitary sewer network. New sanitary sewers will be constructed along the proposed municipal Streets A, B, C, and D and the private roads as required to service all new lots and medium or high density development blocks. All sanitary flows from the proposed development will outlet to the existing 450mm diameter *Western Sub-Trunk Sanitary Sewer* located at southeast corner of Peevers Crescent.

The additional sanitary sewer flows generated within the proposed development will be distributed to the existing surrounding sewers as follows:

- Lots 1-6 fronting onto Alex Doner Drive, west of Hydro Easement shall connect to the existing 250mm dia. sewer along Alex Doner Dr.;
- Blocks 155, 156, 162 and north leg of Street A will outlet to Crossland Gate system upstream of Fairway Garden;
- South leg of Street A and Block 157 will direct flows to existing MH 71A on Alex Doner Drive;
- Street B, Street C, Blocks 159, 160, 161 will outlet to MH 69A; and,
- Street D (located east of Eagle Street) will outlet to Eagle Street sewers at existing MH 48A.

Refer to **Drawing SAN-1** (within map pocket at the end of Report) for a depiction of the proposed sanitary sewer alignments and connection locations to the existing system.

6.7. Proposed Sanitary Flow Analysis

The proposed peak sanitary flow calculations completed for this report are based on a unit flow rate of 360 L/cap/day and the "population per unit" counts defined in the current design standards as shown below:

- Single family homes (and Condo Bungalows): 3.38 ppu;
- Townhomes (Medium Density Blocks): 2.88 ppu; and,
- High Density / Apartment units: 1.95 ppu.

The additional population from the proposed development calculated based on Town's standards is 1,935 people with an additional sanitary drainage area of 30.44 ha of residential and commercial area. Based on these parameters, a total peak sanitary flow rate of 40.77 L/s is calculated by considering each proposed development parcel individually for use in designing the proposed local sanitary sewer.

To consider the total additional sanitary flow generated from the proposed development population of 1935 combined with the existing sanitary flows from the current population of 3216, the new total population of 5151 exhibits a peaking factor of 3.23 at the existing sanitary outlet for the entire Glenway Community at Peevers Crescent (existing MH110).

Table 6.10 provides a breakdown of the proposed development unit and area statistics and their corresponding peak sanitary flow generation rates.

Table 6.10 – Proposed Sanitary Flow Generation

Land Use	Units	Area[1] (ha)	PPU	Pop.	Av. Daily Sanitary Flow (L/s)[2]	Harmon Peaking Factor	Peak San. Flow (L/s)	I & I (L/s)[4]	Total Peak Sanitary Flow (L/s)
Residential (Lots 1 – 154)	154	11.14	3.38	520	2.17	4.0	8.68	3.34	12.02
Residential, Medium Density (Blocks 155 & 161)	229	5.90	2.88	660	2.75	4.0	11.0	1.77	12.77
Residential, Condos (Blocks 158 & 159)	55	4.54	3.38	186	0.78	4.0	3.12	1.36	4.48
Residential, High Density (Block 160)	292	2.34	1.95	569	2.37	3.94	9.35	0.70	10.05
Commercial (Block 162)	--	0.65	--	--	0.3[3]	--	0.30	0.20	0.50
Parkland (Block 163)	--	--	--	--	--	--	--	--	--
Proposed Roadways (Public)	--	3.18	--	--	--	--	--	0.95	0.95
Total	**730**	**30.44**		**1935**				**8.32**	**40.77**

1 Area does not include ponds
2 Based on a residential flow rate of 360 L/cap/day

3 Based on a commercial flow rate of 0.46 L/s/ha
4 Inflow and Infiltration based on a rate of 0.3 L/s/ha

While it is appropriate to utilize each development parcel's individual peak sanitary flow rate based on the higher peaking factor for examination of local sewer capacity at proposed connection points, the combined population peaking factor should be used to examine the total expected flow exiting from the Glenway Community. Based on the combined population peaking factor of 3.23, the proposed development generates a peak sanitary flow of 34.4 L/s at existing MH 110.

As discussed under **Section 6.1**, the original theoretical peak sanitary flow from the Glenway Community was calculated at 177 L/s just downstream of existing manhole 110A, based on the Sewer Design Sheets dated January 1995 and prepared by G.M. Sernas. To analyze the anticipated future sanitary flow conditions, the proposed peak sanitary flow rate of 34.4 L/s was added to each of the following two (2) scenarios for comparison to the original theoretical peak sanitary flow design:

Proposed Scenario 1:

- Existing Peak Sanitary Flow Rate at ex. MH110A under 100-Year Storm based on the Monitoring Program and Chicago 24 hr Storms = 61.9 L/s.
- Proposed Development Peak Theoretical Sanitary Flow Rate at ex. MH110A = 34.4 L/s.
- Total Peak Sanitary Flow Rate at ex. MH110A = **96.3 L/s.**

Proposed Scenario 2:

(Refer to **Appendix B** for a Sanitary Sewer Design Sheet modeling the existing Glenway Community utilizing present day municipal sanitary design flow generation standards).

- Existing Peak Sanitary Flow Rate at ex. MH110A based on Theoretical Design Flows utilizing present day municipal standards = 76.6 L/s.
- Proposed Development Peak Theoretical Sanitary Flow Rate at ex. MH110A = 34.4 L/s.
- Total Peak Sanitary Flow Rate at ex. MH110A = **111.0 L/s.**

Under both scenarios, the total peak sanitary flow rate including the proposed development is less than the original theoretical peak sanitary design flow of 177 L/s.

The limiting existing sanitary sewer outleting from the Glenway Community downstream of Peevers Crescent is a 450mm diameter sanitary sub-trunk at 0.34% grade, exhibiting a full flow capacity of 166.2 L/s, therefore the total peak sanitary flow rate including the proposed development under both scenarios can be adequately conveyed through the existing sanitary sub-trunk.

7.0 Stormwater Management

The proposed Glenway re-development will consist of a combination of single family residential lots, medium density townhouses, a high density residential apartment building complex and a commercial block all connected and serviced by an internal network of municipal and private roads and four (4) private stormwater management (SWM) ponds. The proposed change in land use will increase the volume and rate of stormwater runoff from the site. Therefore; a SWM plan is required to reduce peak runoff rates and provide quality treatment of runoff for the proposed re-development.

7.1. Design Criteria

The proposed development within the Town has been designed in consultation with the drainage and SWM requirements of the Town, the Lake Simcoe Region Conservation Authority (LSRCA) and the MOE standards.

The following guidelines were referenced for SWM design criteria:

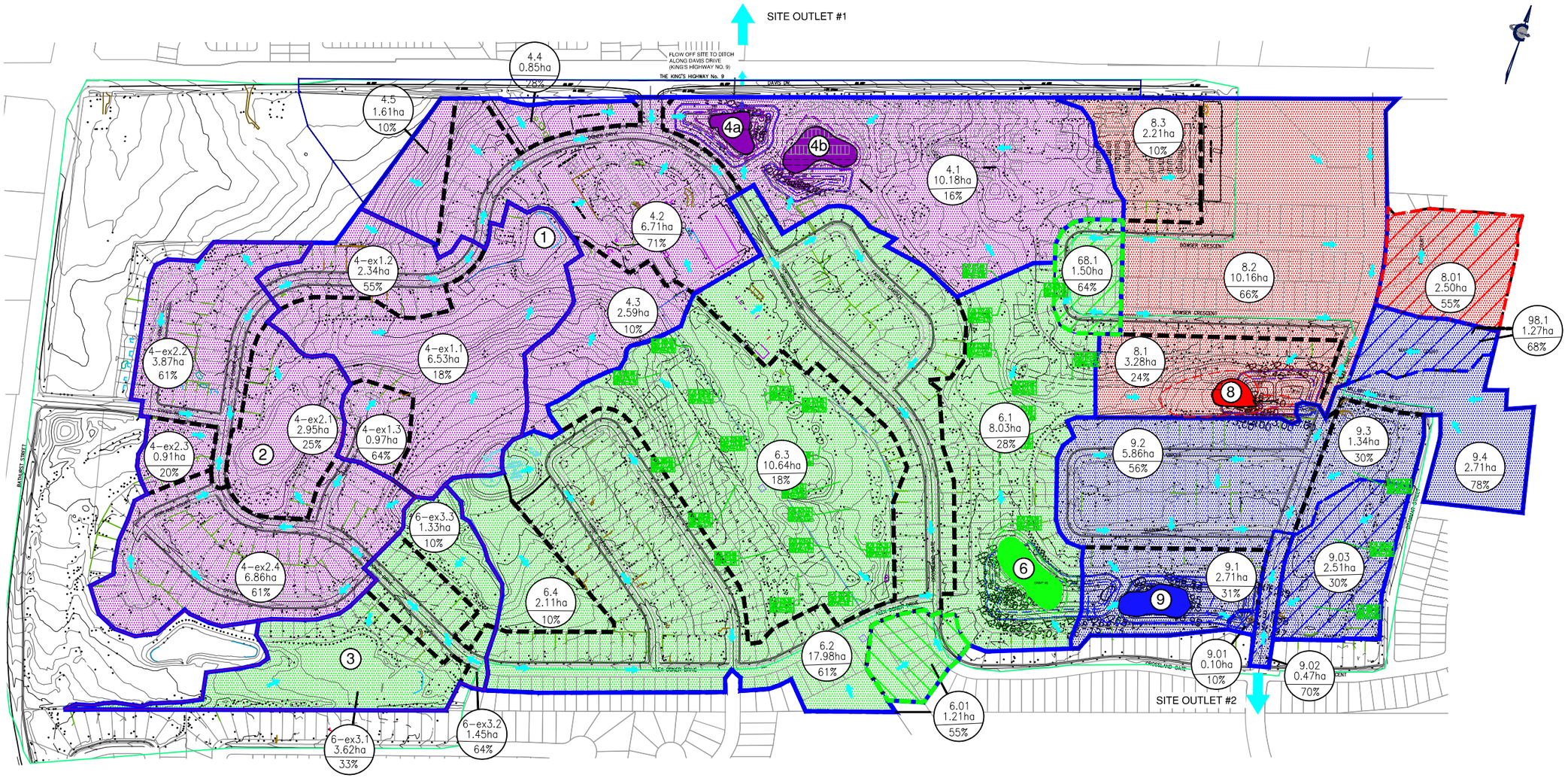
- MOE – SWM Planning and Design Manual (2003);
- LSRCA – Technical Guidelines for SWM Submissions (November 2010), (Technical Guidelines); and,
- Town of Newmarket – Engineering Design Standards and Criteria (January 2009).

The following criteria were used to size the wet ponds:

- Quality Control – MOE Enhanced (Level 1) Protection;
- Quantity Control – Post-development peak flow control to the existing pond two (2) to 100-year peak outflows for greater of the 24-hour SCS, 12-hour SCS and four (4)-hour Chicago design storms;
- Erosion Control – 24-hour detention of the 25 mm, 4-hour Chicago storm; and,
- All Pond design characteristics to meet Town Criteria.

7.2. Existing Hydrologic Conditions

The existing Glenway Community includes an 18-hole golf course surrounded by residential and commercial development. Pre-development drainage areas were delineated based on review of the as-built storm drainage area plans of the existing Glenway Community subdivision completed by The Lathem Group Inc. (1983) and aerial topography information received in October, 2009 from First Base Solutions and a detailed survey conducted by J.D. Barnes in January, 2012. The area proposed for re-development is generally situated east of the existing Hydro One corridor. The existing site is currently divided into four (4) separate drainage areas discharging to four (4) separate ponds located within the eastern half of the 18-hole golf course. There are two (2) drainage outlets from the site, one (1) south along Eagle Street and one (1) north to Davis Drive. The pre-development drainage area plan is illustrated on **Figure 7-1**.



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LEGEND

- A2pre / 5.60ha / 61% — DRAINAGE AREA ID, AREA, RUNOFF COEFFICIENT (#) OR % IMPERVIOUS (#%)
- EXISTING POND PERMANENT WATER LEVEL
- EXISTING 100 YEAR EVENT POND WATER LEVEL
- EXISTING POND DRAINAGE AREA
- EXISTING POND SUB-CATCHMENT DRAINAGE AREA
- (6) POND ID
- DIRECTION OF OVERLAND FLOW
- EXISTING STORM SEWER

PRE-DEVELOPMENT STORM DRAINAGE AREA PLAN

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	JULY, 2013	PROJECT No.:	L09-301
SCALE:	1:6000	FIGURE No.:	7-1

The existing soil conditions were determined to be silty clay till based on the soil investigation done by Soil Engineers Ltd. on December 17, 2011. The local soil is classified under soil group C in the Ministry of Transportation (MTO) Design Chart 1.08. In applying a land use type of pasture and a good hydrologic condition, a soil conservation service (SCS) curve number (CN) of 74 was determined using MTO Design Chart 1.09. The CN* conversion was performed as recommended by the VO2 manual, however; there was no change from the initially derived CN value of 74. The CN* conversion calculation and MTO Design Charts 1.08, 1.09 and 1.10 are included in **Appendix C.**

The imperviousness of the existing land uses was assumed using the Town's design standards. Where it was observed that the existing development has a higher imperiousness than the Town standards, the impervious value used was increased to reflect the actual conditions. The excerpt from the Town of Newmarket design standards providing assumed % imperviousness and runoff coefficients for various land uses is provided in **Appendix J**.

Visual OTTHYMO 2.4 (VO2) was used to model pre-development hydrologic conditions in order to determine the pre-development flows from each of the four (4) ponds that will be affected by the proposed development. A mix of NashHyd and StandHyd objects were used in the model to represent the existing conditions. The input for NashHyds include a runoff coefficient (C) and a time to peak (Tp), the input for StandHyds include a directly connected impervious value (XIMP) and a total impervious value (TIMP). The detailed input parameter calculations for the pre-development hydrologic model are provided in **Appendix D** and summarized below in **Table 7.1.**

Table 7.1 – Pre-Development Input Parameters

Receiving Pond	Catchment	Drainage Area (ha)	CN value	Tp (hr)	XIMP (%)	TIMP (%)
4	4-ex1.1	6.53	74	0.19		
	4-ex1.2	2.34			0.55	0.55
	4-ex1.3	0.97			0.64	0.64
	4-ex2.1	2.95			0.25	0.25
	4-ex2.2	3.87			0.61	0.61
	4-ex2.3	0.91	74	0.17		
	4-ex2.4	6.86			0.61	0.61
	4.1	10.18	74	0.27		
	4.2	6.71			0.71	0.71
	4.3	2.59	74	0.22		
	4.4	0.85			0.28	0.28
	4.5	1.61	74	0.13		
6	6-ex3.1	3.62			0.28	0.28
	6-ex3.2	1.45			0.64	0.64
	6-ex3.3	1.33	74	0.13		
	6.1	8.03	74	0.22		
	6.2	17.98			0.61	0.61
	6.3	10.64	74	0.24		
	6.4	2.11	74	0.26		
	6.01 (major system only)	1.21			0.55	0.55
	68.1 (major system only)	1.5			0.64	0.64

Table 7.1 – Pre-Development Input Parameters (cont'd)

Receiving Pond	Catchment	Drainage Area (ha)	CN value	Tp (hr)	XIMP (%)	TIMP (%)
8	8.1	3.28	74	0.10		
	8.2	10.16			0.66	0.66
	8.3	2.21	74	0.23		
	8.01 (minor system only)	2.5			0.55	0.55
	68.1 (minor system only)	1.5			0.64	0.64
	98.1 (minor system only)	1.27			0.68	0.68
9	9.1	2.71			0.25	0.25
	9.2	5.86			0.56	0.56
	9.3	1.34	74	0.22		
	9.4	2.71			0.25	0.25
	98.1 (major system only)	1.27			0.68	0.68
	9.01 (major system only)	0.10	74	0.05		
	9.02 (major system only)	0.47			0.70	0.70
	9.03 (major system only)	2.51	74	0.27		

The storm distributions used to model pre-development conditions include the 12-hour SCS Type II distribution, as per LSRCA requirements, the 24-hour SCS distribution, as per Town's requirements, and the four (4)-hour Chicago distribution, as per the Town and LSRCA requirements. The intensity-duration-frequency (IDF) data used for the four (4)-hour Chicago storm events was taken from the Town's design standards. The four (4)-hour Chicago IDF curve parameters for all storm events from the two (2)-year to the 100-year storm are summarized in **Table 7.2**.

Table 7.2 – Town of Newmarket IDF Curve Parameters

Storm Event	A	B	C
2-year	648	4	0.784
5-year	930	4	0.798
10-year	1021	3	0.787
25-year	1100	2	0.776
50-year	1488	3	0.803
100-year	1770	4	0.820

The pre-development peak flows for the 12-hour SCS, 24-hour SCS and four (4)-hour Chicago storm distributions are summarized below in **Table 7.3, Table 7.4 and Table 7.5** respectively, and the detailed pre-development model output is provided in **Appendix D**.

Table 7.3 – Pre-development Peak Flows – 12-hour SCS Type II Distribution

	2 year		5 year		10 year		25 year		50 year		100 year	
Catchments	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)
Pond 4	3105	0.306	4529	0.447	5348	0.528	6404	0.633	7213	0.714	8045	0.796
Pond 6	3036	0.697	4344	0.996	5302	1.215	6363	1.771	7117	2.232	7924	2.610
Pond 8	1817	0.650	2559	0.788	3103	0.861	3822	0.958	4365	1.020	4845	1.074
Pond 9	3034	0.476	4487	0.553	5521	0.602	6881	0.667	7948	0.699	9052	0.725

Table 7.4 – Pre-development Peak Flows – 24-hour SCS Distribution

	2 year		5 year		10 year		25 year		50 year		100 year	
Catchments	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)
Pond 4	3759	0.371	4592	0.453	6428	0.636	7666	0.759	8878	0.879	9240	0.915
Pond 6	3582	0.821	4399	1.008	6256	1.709	7482	2.415	8522	2.890	9055	3.121
Pond 8	2047	0.700	2476	0.779	3637	0.937	4449	1.031	5107	1.103	5367	1.131
Pond 9	3497	0.505	4354	0.547	6566	0.652	8115	0.703	9702	0.740	10156	0.750

Table 7.5 – Pre-development Peak Flows – 4-hour Chicago Distribution

	2 year		5 year		10 year		25 year		50 year		100 year	
Catchments	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)	V (m^3)	Peak Flow (m^3/s)
Pond 4	2758	0.272	4283	0.422	5154	0.509	6055	0.598	7212	0.713	7889	0.781
Pond 6	2736	0.627	4131	0.946	5119	1.173	6067	1.584	7294	2.327	8074	2.684
Pond 8	1724	0.640	2601	0.798	3221	0.882	3873	0.968	4779	1.065	5321	1.126
Pond 9	2869	0.465	4502	0.554	5678	0.610	6886	0.667	8543	0.713	9556	0.736

As observed in **Table 7.3**, **Table 7.4** and **Table 7.5**, the results of the pre-development hydrologic analysis indicate that the 24-hour SCS storm distribution provided the largest peak flows and requires the greatest amount of storage volume. Therefore, the pre-development flow targets are to be based on the 24-hour SCS storm distribution, which matches the Town's standard design storm to be used for SWM pond design.

7.3. Adjacent Development Constraints

The proposed development is bound by existing residential lots, golf course lands to be retained, Davis Drive and a commercial site (Go Station). The majority of the development is occurring within the eastern half of the Glenway Country Club golf course lands. A small portion of the golf course on the east side of Eagle St. is also proposed for re-development. There are four (4) existing ponds that accept drainage from land that will be affected by the proposed development as shown on **Figure 7-1** and described in **Section 7.2** of this report. Three (3) of the ponds outlet to the existing Glenway Estates and Country Club storm sewer system; flowing south via Eagle St. One (1) of the ponds outlets off-site to the roadside ditch along Davis Drive.

In order to mitigate impacts to the existing storm infrastructure, the peak discharge rate from each pond under the proposed conditions will be controlled to match the peak discharge rate from each of the ponds under the existing condition using the ponds original design for storage and discharge. This assumes that the existing storm infrastructure is adequate to accommodate the existing development conditions. It is proposed that the existing storm sewer remain unchanged. The original design Storage-Discharge rating for each pond has been taken from Glenway Estates SWM Study (The Lathem Group Inc., 1983).

The design standards for SWM ponds have changed since the existing ponds were designed and constructed. The original design was based on a one (1)-hour AES design storm. A combination of the current Town and LSRCA criteria require post to pre-development peak flow control and pond design for the greater of the two (2) to 100-year four (4)-hour Chicago, 12-hour SCS and 24-hour SCS design storms. The existing conditions were analyzed using the hydrologic modeling software, Visual Otthymo 2.4 (VO2), and the 24-hour SCS Town's design storm was chosen to determine the target flows for each of the ponds. The analysis completed for each pond is described in the following **Sections 7.3.1** to **7.3.4.**

7.3.1. Pond 4

Pond 4 currently receives flow, in series, from both Pond 1 and Pond 2, which are located on the west half of the golf course, via the Glenway Estates and Country Club storm sewer system as well as drainage from the surrounding golf course and residential lots. The existing conditions drainage areas are described in **Table 7.1** and shown on **Figure 7-1.** Pond 4 is divided into two (2) cells (4a and 4b) that are hydraulically connected by a 1200 mm diameter culvert between the two (2) cells whereby cell 4b drains into cell 4a. Pond cell 4a has three (3) inlets, one (1) from pond cell 4b and two (2) from the storm sewer system, and outlets offsite to the ditch along Davis Drive via a 900 mm diameter pipe. The existing Storage-Discharge rating curve for Pond 4 is presented in **Table 7.6** below.

Table 7.6 – Pond 4 Storage-Discharge Rating

Discharge cfs* (m^3/s)**	Storage ac.ft* (ha-m)**
0	0
15.5 (0.438)	3.6 (0.4440)
35.0 (0.991)	8.1 (1.000)
46.0 (1.303)	11.3 (1.3940)
53.0 (1.500)	14.6 (1.8008)
62.0 (1.756)	19.4 (2.3930)

* - Discharge / Area from Glenway Estates SWM Study, The Lathem Group Inc. (1983)
** - Discharge / Area converted to m^3/s and ha-m for use in VO2 hydrologic model. (10000 m^3 = 1 ha-m)

When the existing site conditions were modelled and routed through the original design Pond 4 Storage-Discharge rating curve, the pond outlet flow rates were produced for the 24-hour storm event. The existing conditions Pond 1 flow peak flow rate is also included, which discharges into existing Pond 4. The existing conditions pond release rates will be used to determine the peak flow target release rates for the proposed SWM pond 4 controls. The target flows for Pond 4 are summarized in **Table 7.7**, for which the detailed VO2 model output is provided in **Appendix D**.

Table 7.7 – Target Flows: Pond 4

Storm Event	Peak Flows: 24-hour SCS Pond 4 (m^3/s)	Peak Flows: 24-hour SCS Pond 1 (m^3/s)	Peak Flows: 24-hour SCS Target Difference (m^3/s)
2-year	0.372	0.363	0.009
5-year	0.453	0.401	0.052
10-year	0.636	0.506	0.130
25-year	0.759	0.579	0.180
50-year	0.879	0.649	0.230
100-year	0.915	0.666	0.249

The target flows for Pond 4 were determined by the difference in flows between Pond 1 and Pond 4. The discharge from Pond 1 is proposed to be routed around Pond 4, to discharge directly to the roadside ditch on Davis Drive. The purpose of this was to decrease the permanent pool volume required for Pond 4 quality treatment, as was suggested by comments received from the LSRCA.

7.3.2. Pond 6

Pond 6 currently receives flow from existing Pond 3, which is located on the east half of the golf course, via the Glenway Estates and Country Club storm sewer system as well as drainage from the surrounding golf course and residential lots. The existing drainage areas are described in **Table 7.1** and shown on **Figure 7-1.**

Pond 6 has one (1) inlet and one (1) outlet and discharges to the storm sewer system through a 1350 mm diameter pipe and connected to an existing 1800 mm dia. storm sewer on Crossland Gate. The 1800 mm diameter storm sewer flows east along Crossland Gate and south at Eagle Street to Western Creek.

The existing Storage-Discharge rating curve for Pond 6 is presented in **Table 7.8** below.

Table 7.8 – Pond 6 Storage-Discharge Rating

Discharge Cfs* (m^3/s)**	Storage ac.ft* (ha-m)**
0	0
45.0 (1.274)	4.5 (0.555)
80.0 (2.265)	5.8 (0.7154)
110.0 (3.115)	7.3 (0.9004)
128.0 (3.625)	9.4 (1.160)
140.0 (3.964)	11.0 (1.357)

* - Discharge / Area from Glenway Estates Stormwater Management Study, The Lathem Group Inc. (1983)
** - Discharge / Area converted to m^3/s and ha-m for use in VO2 hydrologic model. (10000 m^3 = 1 ha-m)

When the existing site conditions were modelled and routed through the original design Pond 6 Storage-Discharge rating curve, the pond outlet flow rates were produced for the 24-hour storm event. These existing conditions pond release rates will become the peak flow target release rates for the proposed SWM pond 6 controls. The target flows for Pond 6 are summarized in **Table 7.9**, for which the detailed VO2 model output is provided in **Appendix D**.

Table 7.9 – Target Flows: Pond 6

Storm Event	Peak Flows: 24-hour SCS (m^3/s)
2-year	0.821
5-year	1.008
10-year	1.709
25-year	2.415
50-year	2.890
100-year	3.121

7.3.3. Pond 8

Pond 8 currently receives runoff from the surrounding golf course, residential lots and nearby commercial lots at Davis Drive and Yonge Street. The onsite stormwater controls of the commercial lots are unknown, therefore it was assumed that runoff from these lots is uncontrolled. The existing drainage areas are described in **Table 7.1** and shown on **Figure 7-1.** Pond 8 has one (1) inlet and one (1) outlet and discharges to the storm sewer system through a 750 mm diameter pipe. The storm sewer flows south along Eagle Street and west under Glenway Circle from which it discharges into Pond 9. The existing Storage-Discharge rating curve for Pond 8 is presented in **Table 7.10** below.

Table 7.10 – Pond 8 Storage-Discharge Rating

Discharge Cfs* (m^3/s)**	Storage ac.ft* (ha-m)**
0	0
16.0 (0.543)	1.0 (0.1233)
27.0 (0.765)	1.9 (0.2343)
34.0 (0.963)	3.1 (0.3823)
46.0 (1.303)	5.6 (0.6907)
56.0 (1.586)	8.9 (1.0977)

* Discharge / Area from Glenway Estates Stormwater Management Study, The Lathem Group Inc. (1983)
**Discharge / Area converted to m^3/s and ha-m for use in VO2 hydrologic model. (10000 m^3 = 1 ha-m)

When the existing site conditions were modelled and routed through the original design Pond 8 Storage-Discharge rating curve, the pond 24-hour storm peak outlet flow rates were produced. These existing conditions pond outflow rates will become the peak flow target release rates for the proposed SWM pond 8 controls. The target flows for Pond 8 are summarized in **Table 7.11**, for which the detailed VO2 model output is provided in **Appendix D**.

Table 7.11 – Target Flows: Pond 8

Storm Event	Peak Flows: 24-hour SCS (m^3/s)
2-year	0.700
5-year	0.779
10-year	0.937
25-year	1.031
50-year	1.103
100-year	1.131

7.3.4. Pond 9

Pond 9 currently receives flow from Pond 8, via the Glenway Estates and Country Club storm sewer system as well as drainage from the surrounding golf course and residential lots. The existing drainage areas are described in **Table 7.1** and shown on **Figure 7-1.**

Pond 9 has one (1) inlet and one (1) outlet and discharges to an existing 1050 mm dia. storm sewer on Eagle Street through a 525 mm diameter outlet pipe. The 1050 mm diameter storm sewer flows south along Eagle Street to Western Creek.

The existing Storage-Discharge rating curve for Pond 9 is presented in **Table 7.12** below.

Table 7.12 – Pond 9 Storage-Discharge Rating

Discharge Cfs* (m^3/s)**	Storage ac.ft* (ha-m)**
0	0
10.5 (0.297)	1.0 (0.1233)
15.0 (0.425)	2.9 (0.222)
18.0 (0.51)	2.9 (0.3577)
24.0 (0.68)	5.8 (0.7154)
28.0 (0.793)	9.7 (1.1964)

* Discharge / Area from Glenway Estates Stormwater Management Study, The Lathem Group Inc. (1983)
** Discharge / Area converted to m^3/s and ha-m for use in VO2 hydrologic model. (10000 m^3 = 1 ha-m)

When the existing site conditions were modelled and routed through the original design Pond 9 Storage-Discharge rating curve, the pond 24-hour storm peak outlet flow rates were produced. These existing conditions pond outflow rates will become the peak flow target release rates for the proposed SWM Pond 9 controls. The target flows for Pond 9 are summarized in **Table 7.13**, for which the detailed VO2 model output is provided in **Appendix D**.

Table 7.13 – Target Flows: Pond 9

Storm Event	Peak Flows: 24-hour SCS (m^3/s)
2-year	0.505
5-year	0.546
10-year	0.651
25-year	0.702
50-year	0.739
100-year	0.749

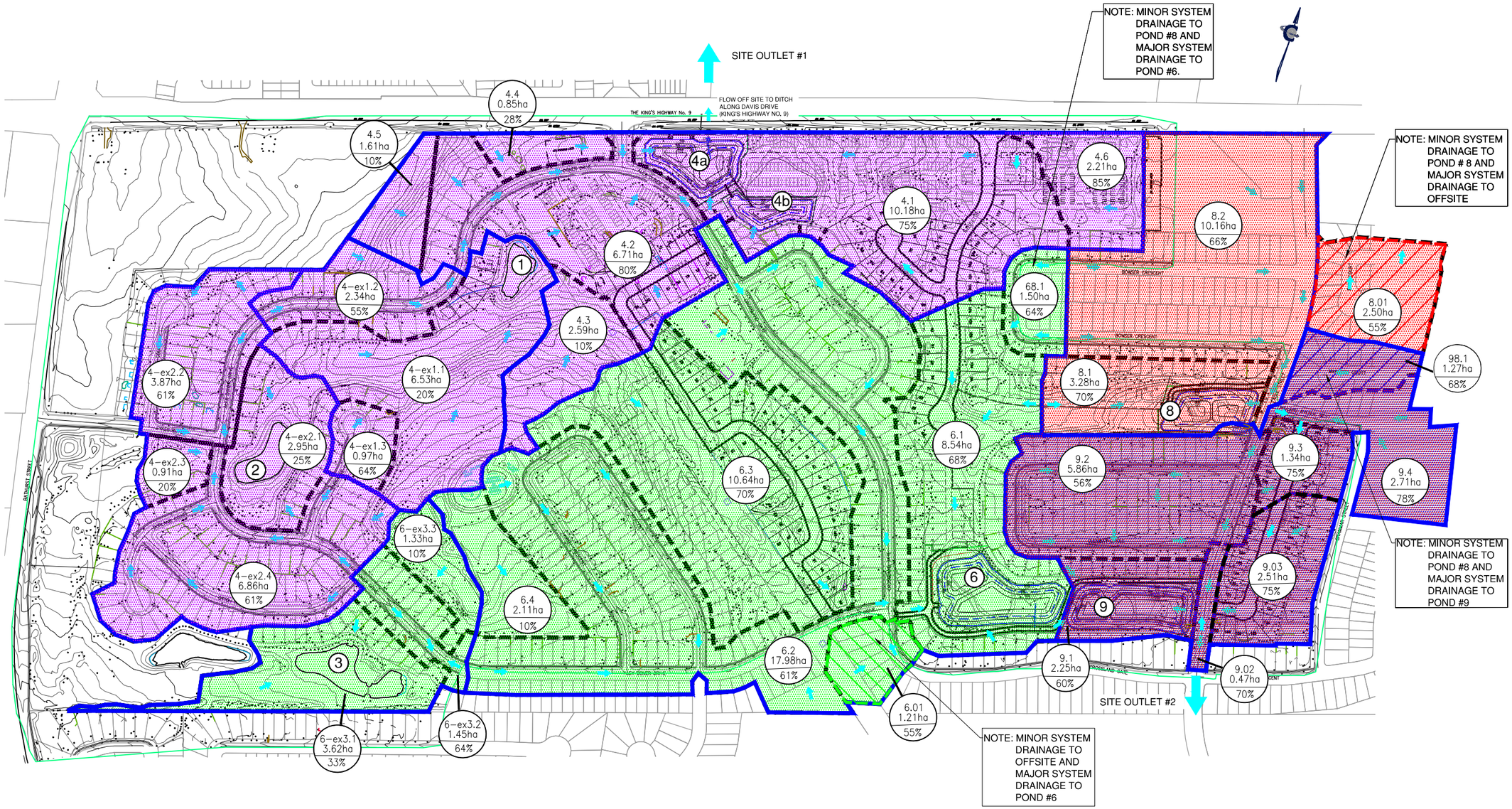
7.4. Proposed Conditions

Under post-development conditions, it is expected that changes to site drainage patterns and land cover will affect the hydrologic behaviour of the site. The post-development drainage conditions for the major and minor system are shown in **Figure 7-2**. To mitigate these hydrologic changes, it is proposed to direct storm drainage from the development to four (4) proposed retrofitted on-site SWM ponds, as shown on **Figure 7-2**.

The proposed development involves converting existing golf course land into single detached units, condo units, townhouses, an apartment building and a commercial block with dedicated parkland and a trail system. The proposed development will increase the total impervious cover of the site to approximately 55% from the existing golf course condition. The imperviousness of proposed land uses was assumed using the Town's design standards. Where it was observed that the proposed development plan would have a higher imperiousness than the Town standards, the impervious value used was increased to reflect the actual proposed conditions shown in the Draft Plan of Subdivision prepared by Zelinka Priamo Ltd., dated February 2013. The following typical imperviousness was assigned to the following land uses based on Town standards and proposed conditions based on the development plan:

- 0% impervious or a runoff coefficient of 0.20 for existing and proposed golf course and open grassed areas;
- 55% impervious for proposed single detached units and proposed condo blocks;
- 55% to 65% impervious or a runoff coefficient of 0.59 to 0.66 for existing single detached units based on conditions observed in satellite images of the existing development;
- 75% impervious or a runoff coefficient of 0.73 for proposed townhouse blocks;
- 85% impervious for the proposed apartment block;
- 100% impervious or a runoff coefficient of 0.90 for existing and proposed ponds;
- 90% impervious or a 0.83 runoff coefficient for existing and proposed commercial blocks; and,
- 70% impervious or a 0.69 runoff coefficient for existing and proposed roads and right-of-ways.

Visual OTTHYMO 2.4 (VO2) was used to model post-development hydrologic conditions in order to determine the required pond sizes to match pre-development peak flows from each of the four (4) ponds that will be affected by the proposed development. A mix of NashHyd and StandHyd objects were used in the model to represent the existing conditions. The input for NashHyds include a runoff coefficient (C) and a time to peak (Tp), the input for StandHyds include a directly connected impervious value (XIMP) and a total impervious value (TIMP). The detailed input parameter calculations for the post-development hydrologic model are provided in **Appendix E** and summarized below in **Table 7.14.**



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LEGEND

- A2pre 5.60ha 61% — DRAINAGE AREA ID, AREA, RUNOFF COEFFICIENT (#) OR % IMPERVIOUS (#%)
- PROPOSED POND PERMANENT WATER LEVEL
- PROPOSED 100 YEAR EVENT POND WATER LEVEL
- PROPOSED POND DRAINAGE AREA
- PROPOSED POND SUB-CATCHMENT DRAINAGE AREA
- (6) POND ID
- DIRECTION OF OVERLAND FLOW
- EXISTING STORM SEWER

POST-DEVELOPMENT STORM DRAINAGE AREA PLAN

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER, 2013	PROJECT No.:	L09-301
SCALE:	1:6000	FIGURE No.:	7-2

Table 7.14 – Post-Development Input Parameters

Receiving Pond	Catchment	Drainage Area (ha)	CN value	Tp (hr)	XIMP (%)	TIMP (%)
4	4-ex1.1	6.53	74	0.19		
	4-ex1.2	2.34			0.55	0.55
	4-ex1.3	0.97			0.64	0.64
	4-ex2.1	2.95			0.25	0.25
	4-ex2.2	3.87			0.61	0.61
	4-ex2.3	0.91	74	0.17		
	4-ex2.4	6.86			0.61	0.61
	4.1	10.18			0.75	0.75
	4.2	6.71			0.80	0.80
	4.3	2.59	74	0.22		
	4.4	0.85			0.28	0.28
	4.5	1.61	74	0.13		
	4.6	2.21			0.85	0.85
6	6-ex3.1	3.62			0.28	0.28
	6-ex3.2	1.45			0.64	0.64
	6-ex3.3	1.33	74	0.13		
	6.1	8.53			0.65	0.65
	6.2	17.98			0.61	0.61
	6.3	10.64			0.70	0.70
	6.4	2.11	74	0.26		
	6.01 (major system only)	1.21			0.55	0.55
	68.1 (major system only)	1.50			0.64	0.64
8	8.1	3.28			0.70	0.70
	8.2	10.16			0.66	0.66
	8.01 (minor system only)	2.50			0.55	0.55
	68.1 (minor system only)	1.50			0.64	0.64
	98.1 (minor system only)	1.27			0.68	0.68
9	9.1	2.25			0.60	0.60
	9.2	5.86			0.56	0.56
	9.3	1.34			0.75	0.75
	9.4	2.71			0.25	0.25
	98.1 (major system only)	1.27			0.68	0.68
	9.02	0.47			0.70	0.70
	9.03	2.51			0.75	0.75

The proposed SWM plan, which includes four (4) retrofitted SWM pond facilities, will satisfy water quality and quantity control requirements. The proposed ponds are to provide quality, quantity and erosion control, as discussed in **Sections 7.5 and 7.6**.

7.5. Stormwater Quantity Control

A hydrologic model was prepared to simulate the hydrologic conditions of the site under post-development conditions at all four (4) ponds. The post-development conditions for each pond are described in **Sections 7.5.1** to **7.5.4**.

A hydrologic VO2 model was used to determine the required storage of the proposed pond to control peak flows to target flow rates. The 24-hour SCS storm distribution provided in the Town's standards was used for the storage analysis.

As discussed in **Section 7.4**, the post-development flows discharging from each pond are to be controlled to pre-development flow rates. The discharge from the developments that drains to each pond is proposed to be controlled by retrofitting the existing ponds to accommodate the additional runoff and meet current Town's standards, LSRCA criteria and MOE SWM guidelines. The existing ponds currently provide some attenuation, but were not designed to meet a specific level of protection, however many of the ponds cause flooding on private property during major events (100-year storm) as modelled using the one (1)-hour AES storm by The Lathem Group (1983).

7.5.1. Pond 4

The proposed pond is designed to provide adequate control and storage volume required in order to control the post-development peak flows to pre-development flow rates from Pond 4. Physically, the pond will remain as two (2) hydraulically connected cells, but will be resized and repositioned. The 4A cell will be increased in size, while cell 4B will be moved further south and made smaller.

The outlet location for the retrofitted Pond 4 is proposed to remain the same as the existing pond; however the outlet controls will require improvements. The 900 mm diameter outlet pipe discharges to the ditch that runs along Davis Drive and ultimately flows through a culvert under Davis Drive. The pond outlet controls will be revised to include a bottom draw pipe to a 200 mm diameter orifice plate and a ditch inlet catch-basin with a 200 mm diameter orifice tube for 2-100 year quantity controls. The pond stage-storage-discharge design sheet is included in **Appendix F**.

The post-development quantity control analysis of Pond 4 is summarized in **Table 7.15**, for which the detailed hydrologic model output is provided in **Appendix G**.

Table 7.15 – Quantity Control Analysis: Pond 4

Storm Event	Target Flow at Pond Outlet (m^3/s)	Inflow To Pond (m^3/s)	Pond Active Storage (m^3)	Outflow From Pond (m^3/s)
2-year	0.009	2.977	6232	0.101
5-year	0.052	3.507	7438	0.110
10-year	0.130	4.834	10628	0.130
25-year	0.180	5.747	12736	0.140
50-year	0.230	6.215	14889	0.149
100-year	0.249	6.909	15500	0.151
Provided Active Storage (2.0 m)	--	--	15887	0.153

EMERGENCY SPILLWAY 25 m
FLAT BOTTOM AT INV. 271.70
SPILLWAY AND RECEIVING DITCH
TO BE LINED WITH RIP-RAP

EX. EOP

EX. DITCH

EX. 1220 X 1220 mm BOX CULVERT
U/S INV. 269.12

EX. 900 mmØ PIPE
D/S INV. 269.60

EX. EOP

EX. DITCH

3:1 MAX. SLOPE

3:1 MAX. SLOPE TO MATCH EX.

271.00

HWL = 271.70

4:1 MAX.

NWL = 269.70

7:1 MAX.

4:1 MAX.

FOREBAY = 267.70

4.0

7.0

10% MAX.

MAIN CELL

BOTTOM = 267.20

4:1 MAX.

7:1 MAX.

4:1 MAX.

3.0 m WIDE ACCESS ROAD
10% MAX. SLOPE TO FOREBAY

DECOMMISSION
SECTION OF
EXISTING PIPE

2- 900 x 600 mm, 20.5 m CONC. BOX
CULVERT AT 1% SLOPE
U/S INV. 271.70

1200 mmØ CONC.
CULVERT W/ HEADWALL @ 0.5%
U/S INV. 269.70

SAFETY SHELF @ 7:1
FOR 3.5 m ABOVE &
BELOW NWL

DECOMMISSION
SECTIONS OF
EXISTING SEWER

MAX. 3:1 TO
MATCH EX.
AROUND
PERIMETER

BLOCK 167
SWM POND AND
OPEN SPACE

3:1 MAX. SLOPE

3:1 MAX. SLOPE

HWL = 271.70

4:1 MAX.

7:1 MAX.

NWL = 269.70

4:1 MAX.

BOTTOM = 268.70

FOREBAY

7.0

10% MAX.

MIN. 3.0 m WIDE ACCESS ROAD
10% MAX. SLOPE TO FOREBAY

SAFETY SHELF @ 7:1
FOR 3.5 m ABOVE &
BELOW NWL

MAX. 3:1 TO
MATCH EX.

NOTES:

PERMANENT POOL DEPTH = 2.0 m - 2.5 m
ACTIVE STORAGE DEPTH = 2.0 m

OUTLET CONTROLS:
250 mmØ BOTTOM DRAW WITH 200 mmØ ORIFICE
PLATE INV. 269.70
DICB AT INV. 270.30 WITH 200 mmØ ORIFICE
TUBE AT INV. 269.70

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LEGEND

- PROPOSED POND NORMAL (PERMANENT) WATER LEVEL
- PROPOSED HIGH WATER LEVEL (100 YEAR)
- ×271.39 EXISTING GRADE
- 271.39× PROPOSED GRADE
- PROPOSED POND BLOCK BOUNDARY
- MAINTENANCE ACCESS EASEMENT
- DIRECTION OF OVERLAND FLOW
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

PROPOSED POND 4

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER, 2013	PROJECT No.:	L09-301
SCALE:	1:750	FIGURE No.:	7-3

As shown in **Table 7.15**, the maximum required active pond storage to control the post-development peak flows to pre-development conditions is 15,500 m^3. The proposed retrofitted SWM Pond 4 provides 15,880 m^3 of active storage at an elevation of 271.70 m, and therefore meets the quantity control requirements for MOE and the Town.

It is identified that the discharge from the proposed pond 4 exceeds the target flowrates for the 2 and 5-year storm events, however this comes as a result of routing discharge from Pond 1 around Pond 4, but still trying to maintain the existing conditions peak discharge rates. In order to achieve the discharge rates for the 5-year storm, an orifice size would need to be so small that the drawdown time would exceed a 72 hour time period. In addition to this, using a minimum orifice size (75mm) would still not be able to meet the 2-year target discharge rate of 9 L/s. The conceptual retrofitted Pond 4 layout is shown in **Figure 7-3**.

The overflow spillway location is near the main outlet structure consisting of a weir, sized to pass the uncontrolled 100 year storm. The overflow begins at 2.0 m above the permanent pool and will also discharge to Davis Drive to the north, as it currently during existing conditions. The emergency spillway will have a 25 m wide bottom width and a height of 0.4 m. The emergency spillway is discussed further in **Section 7.6.3**.

7.5.2. Pond 6

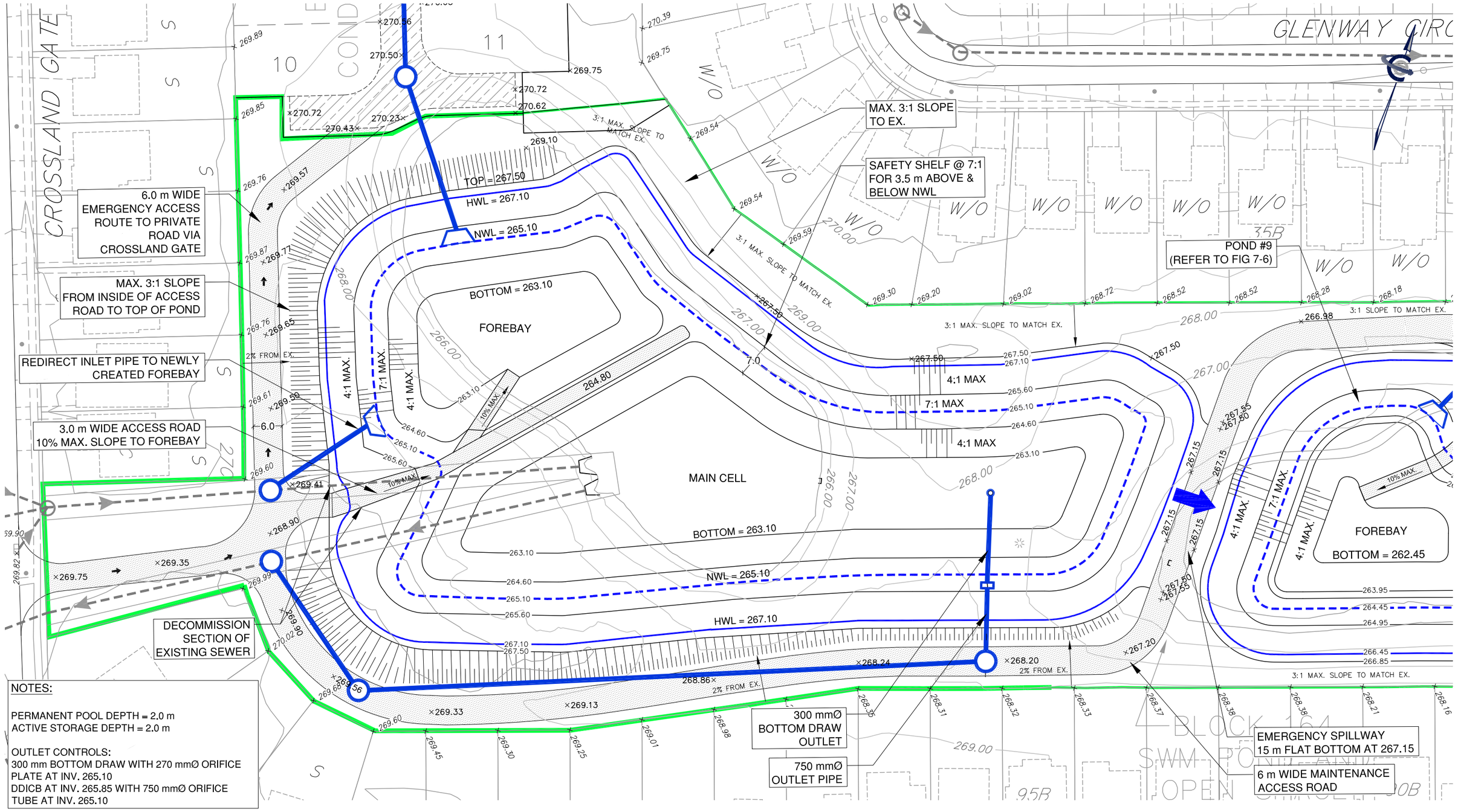
The proposed pond is designed to provide adequate control and storage volume required in order to control the post-development peak flows to the existing conditions target flow rates from Pond 6. The existing pond will be expanded to provide more storage to control runoff from the proposed and existing developments to the existing conditions peak flow rates up to the 100 year storm. The pond is also being expanded in order to limit the maximum water level, during storage of the 100 year storm runoff, to less than or equal to 2.0 m.

The proposed Pond 6 outlet location will remain the same as the existing conditions; however the outlet controls will change from the existing. The 1350 mm diameter outlet pipe connects to the 1800 mm storm sewer system which flows east along Crossland Gate and south along Eagle Street to discharge to Western Creek. The proposed outlet controls include a bottom draw pipe to a 270 mm diameter orifice plate and a ditch inlet catch-basin with a 750 mm diameter orifice tube and a 15 m wide emergency spillway. The pond stage-storage-discharge design sheet is included in **Appendix F**.

The post-development quantity control analysis of Pond 6 is summarized in **Table 7.16**, for which the detailed hydrologic model output is provided in **Appendix G**.

Table 7.16 – Quantity Control Analysis: Pond 6

Storm Event	Target Flow at Pond Outlet (m3/s)	Inflow To Pond (m3/s)	Pond Active Storage (m3)	Outflow From Pond (m3/s)
2-year	0.821	5.010	9124	0.584
5-year	1.008	5.919	10374	0.996
10-year	1.709	8.205	13673	1.631
25-year	2.415	9.805	16114	1.774
50-year	2.890	10.653	18312	1.900
100-year	3.121	11.896	19284	1.957
Provided Active Storage (2.0 m)	--	--	19831	2.026



NOTES:

PERMANENT POOL DEPTH = 2.0 m
ACTIVE STORAGE DEPTH = 2.0 m

OUTLET CONTROLS:
300 mm BOTTOM DRAW WITH 270 mmØ ORIFICE PLATE AT INV. 265.10
DDICB AT INV. 265.85 WITH 750 mmØ ORIFICE TUBE AT INV. 265.10

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LEGEND

- PROPOSED POND NORMAL (PERMANENT) WATER LEVEL
- PROPOSED HIGH WATER LEVEL (100 YEAR)
- ×271.39 EXISTING GRADE
- 271.39× PROPOSED GRADE
- PROPOSED POND BLOCK BOUNDARY
- MAINTENANCE ACCESS EASEMENT
- DIRECTION OF OVERLAND FLOW
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EMERGENCY ACCESS ROUTE

PROPOSED POND 6

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER, 2013	PROJECT No.:	L09-301
SCALE:	1:750	FIGURE No.:	7-4

As shown in **Table 7.16**, the maximum required active pond storage to control the post-development peak flows to pre-development conditions is 19,284 m^3. The proposed retrofitted SWM Pond 6 provides 19,831 m^3 of maximum active storage at an elevation of 267.10 m, and therefore; meets the quantity control requirements for MOE and the Town. The conceptual retrofitted Pond 6 layout is shown in Figure 7-4.

The overflow weir from Pond 6 is located on the southeast end of the pond and flows directly east to Pond 9. In order to reach the overflow location, water would need to fill up 0.05 m above the 100 year water level. The emergency spillway will have a 15 m wide bottom width and a minimum height of 0.4 m. The proposed maintenance access and trail pass along the overflow spillway; therefore the side slopes of the spillway will not exceed 10%. The emergency spillway will be discussed further in **Section 7.6.3**.

7.5.3. Pond 8

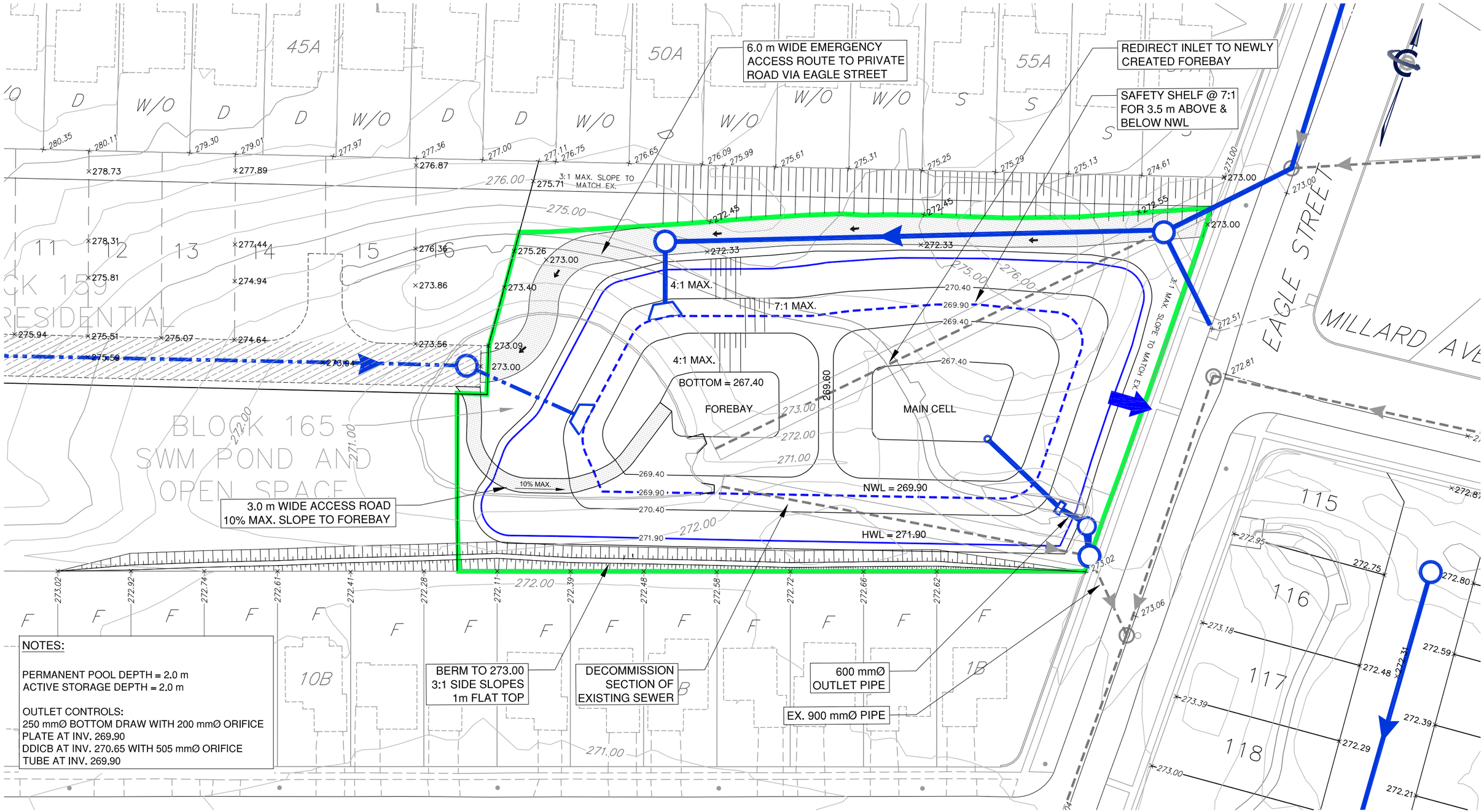
The proposed pond is designed to provide adequate control and storage volume required in order to control the post-development peak flows to existing conditions target flow rates from Pond 8. The existing pond is proposed to be expanded to provide storage required to match proposed development peak flows to existing conditions. The maximum storage depth during a 100 year storm will be 2.0 m or less.

The proposed Pond 8 outlet location is proposed to remain the same as the existing pond; however the outlet controls and sizing will change from the existing. The existing 750 mm diameter outlet pipe connects to the 975 mm diameter storm sewer and flows south along Eagle Street and west along Glenway Circle from which it discharges into Pond 9. Quantity controls for Pond 8 will include a bottom draw pipe to a 160 mm diameter orifice plate, a ditch inlet catch-basin and a 525 mm diameter orifice tube. The pond stage-storage-discharge design sheet is included in **Appendix F**.

The post-development quantity control analysis of Pond 8 is summarized in **Table 7.17**, for which the detailed hydrologic model output is provided in **Appendix G**.

Table 7.17 – Quantity Control Analysis: Pond 8

Storm Event	Target Flow at Pond Outlet (m3/s)	Inflow To Pond (m3/s)	Pond Active Storage (m3)	Outflow From Pond (m3/s)
2-year	0.700	2.409	4,100	0.460
5-year	0.779	2.840	4,708	0.707
10-year	0.937	3.922	6,342	0.807
25-year	1.031	4.548	7,348	0.868
50-year	1.103	4.818	8,220	0.922
100-year	1.131	5.232	8,538	0.941
Provided Active Storage (2.0 m)	--	--	9,685	1.011



NOTES:

PERMANENT POOL DEPTH = 2.0 m
ACTIVE STORAGE DEPTH = 2.0 m

OUTLET CONTROLS:
250 mmØ BOTTOM DRAW WITH 200 mmØ ORIFICE PLATE AT INV. 269.90
DDICB AT INV. 270.65 WITH 505 mmØ ORIFICE TUBE AT INV. 269.90

LEGEND

- PROPOSED POND NORMAL (PERMANENT) WATER LEVEL
- PROPOSED HIGH WATER LEVEL (100 YEAR)
- ×271.39 EXISTING GRADE
- 271.39× PROPOSED GRADE
- PROPOSED POND BLOCK BOUNDARY
- MAINTENANCE ACCESS EASEMENT
- DIRECTION OF OVERLAND FLOW
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EMERGENCY ACCESS ROUTE

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PROPOSED POND 8

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ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER, 2013	PROJECT No.:	L09-301
SCALE:	1:750	FIGURE No.:	7-5

As shown in **Table 7.17**, the maximum required active pond storage to control the post-development peak flows to pre-development conditions is 8,538 m^3. The proposed retrofitted SWM Pond 8 provides 9,685 m^3 of active storage at an elevation of 271.90 m, and therefore meets the quantity control requirements for MOE and Town. The conceptual retrofitted Pond 8 layout is shown in **Figure 7-5**.

The overflow path for Pond 8 will not remain in the same location as during existing conditions, which currently passes south through existing residential lots. Emergency overflow from Pond 8 is proposed to flow back out to Eagle Street, back up along Millard Ave to pass down proposed Street D to Pond 9. This will be made possible through creating a berm along the south side of Pond 8 to a height of 273.0 m, whereas the lowest elevation along the sidewalk on Eagle Street is 272.52 m. There is approximately an additional 3,300 m^3 of emergency storage prior to reaching the overflow location onto Eagle Street. The emergency overflow will be discussed further in **Section 7.6.3.**

7.5.4. Pond 9

The proposed pond is designed to provide the adequate control and storage volume required in order to control the post-development peak flows to existing conditions flow rates from Pond 9. The existing pond is proposed to be expanded to provide the storage required to match proposed development peak flow rates to existing conditions. The maximum active storage will be controlled to 2 m or less for all storms up to the 100 year.

The proposed Pond 9 outlet location is proposed to remain the same as the existing pond; however the outlet controls will change to meet peak flow requirements. The 525 mm diameter outlet pipe connects to the 1050 mm diameter storm sewer system and flows south along Eagle Street to Western Creek. Proposed quantity controls for Pond 9 will include a bottom draw pipe to a 200 mm diameter orifice plate, a ditch inlet catch-basin and a 505 mm diameter orifice plate. The pond stage-storage-discharge design sheet is included in **Appendix F**.

The post-development quantity control analysis of Pond 9 is summarized in **Table 7.18**, for which the detailed hydrologic model output is provided in **Appendix G**.

Table 7.18 – Quantity Control Analysis: Pond 9

Storm Event	Target Flow at Pond Outlet (m^3/s)	Inflow To Pond (m^3/s)	Pond Active Storage (m^3)	Outflow From Pond (m^3/s)
2-year	0.505	1.873	4,472	0.360
5-year	0.546	2.312	5,800	0.406
10-year	0.651	3.619	9,050	0.519
25-year	0.702	4.371	11,055	0.589
50-year	0.739	4.740	12,860	0.652
100-year	0.749	5.234	13,387	0.670
Provided Active Storage (2.0 m)	--	--	15,375	0.739

POND #6
(REFER TO FIG 7-4)

REDIRECT INLET TO NEWLY CREATED FOREBAY

3.0 m WIDE ACCESS ROAD
10% MAX. SLOPE TO FOREBAY

6 m WIDE MAINTENANCE ACCESS ROAD

SAFETY SHELF @ 7:1
FOR 3.5 m ABOVE &
BELOW NWL

3:1 SLOPE TO MATCH EX.

6.0

3:1

4:1 MAX

7:1 MAX

7.0

4:1 MAX

FOREBAY

BOTTOM = 262.45

MAIN CELL

BOTTOM = 262.45

10% MAX.

4:1 MAX.

7:1 MAX.

4:1 MAX.

264.15

NWL = 264.45

HWL = 266.45

3:1 MAX. SLOPE TO MATCH EX.

3:1 MAX. SLOPE TO MATCH EX.

3:1 MAX. SLOPE TO MATCH EX.

MAX. 3:1 SLOPE TO EX. AROUND POND PERIMETER

DECOMMISSION SECTION OF EXISTING SEWER

525 mmØ OUTLET PIPE

BERM ALONG P/L TOP EL. 268.15

EX. 525 mmØ PIPE

EMERGENCY SPILLWAY
6 m WIDE BOTTOM
AT EL. 267.85

EAGLE STREET

BLOCK 164
SWM POND A

NOTES:

PERMANENT POOL DEPTH = 2.0 m
ACTIVE STORAGE DEPTH = 2.0 m

OUTLET CONTROLS:
250 mmØ BOTTOM DRAW WITH 200 mmØ ORIFICE PLATE AT INV. 264.45
DDICB AT INV. 264.85 WITH 505 mmØ ORIFICE PLATE AT INV. 264.45

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LEGEND

- PROPOSED POND NORMAL (PERMANENT) WATER LEVEL
- PROPOSED HIGH WATER LEVEL (100 YEAR)
- ×271.39 EXISTING GRADE
- 271.39× PROPOSED GRADE
- PROPOSED POND BLOCK BOUNDARY
- MAINTENANCE ACCESS EASEMENT
- DIRECTION OF OVERLAND FLOW
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

PROPOSED POND 9

MARIANNEVILLE DEVELOPMENTS LTD.
ESTATES OF GLENWAY NEWMARKET
TOWN OF NEWMARKET

DATE:	NOVEMBER, 2013	PROJECT No.:	L09-301
SCALE:	1:750	FIGURE No.:	7-6

As shown in **Table 7.18**, the maximum required active pond storage to control the post-development peak flows to pre-development conditions is 13,387 m^3. The proposed retrofitted SWM Pond 9 provides 15,375 m^3 of active storage at an elevation of 266.45 m, and therefore; meets the required quantity control needs. The conceptual retrofitted Pond 9 layout is shown in **Figure 7-6**.

The emergency overflow path from Pond 9 will remain as it is in existing conditions, with some improvements. During extreme events, Pond 9 receives overflow from Pond 6. The overflow from Pond 9 will flow towards the east and spill on to the Eagle Street R.O.W. and flow south. The existing lots along the south end of Pond 9 have been surveyed at an approximate minimum elevation of 268.00 m, which is located at Eagle Street. The proposed emergency spillway is discussed in further detail in **Section 7.6.3.**

7.6. Pond Physical Design Characteristics

The proposed SWM ponds have been designed to satisfy the Town's design standards where possible as well as the MOE SWMP Design Guidelines and LSRCA design criteria.

7.6.1. Design Criteria

The Town's engineering design criteria have been met for all ponds where constraints did not interfere with the layout of pond. The Town's design criteria are listed in **Table 7.19** and each pond is listed with how it was designed.

Table 7.19 – Town of Newmarket SWM Pond Design Characteristics

Design Characteristic	Town Minimum Standard	Pond 4	Pond 6	Pond 8	Pond 9
Sideslopes	4:1	4:1	4:1	4:1	4:1
Safety Shelf	7:1 for 3.5 m either side of NWL	7:1 for 3.5 m either side of NWL	7:1 for 3.5 m either side of NWL	7:1 for 3.5 m either side of NWL	7:1 for 3.5 m either side of NWL
P. Pool Depth	2.5 m	2.5 m	2.0 m	2.5 m	2.0 m
Active Storage Maximum Depth	2.0 m	2.0 m	2.0 m	2.0 m	2.0 m
Min. Freeboard	0.4 m (20% of Active Storage Depth)	0.4 m	0.5 m	0.8 m	1.5 m
Emergency Overflow	0.1 m^3/s/ha	0.1 m^3/s/ha	0.1 m^3/s/ha	Dependant on Eagle St. grades	Dependant on Eagle St. / Millard Ave. grades
Maintenance Access	3.0 m wide and 10% max grade	4.0 m wide @ 10%	4.0 m wide @ 10%	4.0 m wide @ 10%	4.0 m wide @ 10%

It can be seen that the design features of each pond meet or exceed the Town's minimum standard, with the exception of the spillway sizing for Ponds 8 and 9. The physical constraints placed around these two (2) ponds limit the feasibility of an emergency overflow outlet. The pond emergency outlet options are limited to the existing surrounding topography. The overflow spillway options for each pond are described in **Section 7.6.3.**

7.6.2. Grading

The grading of the proposed SWM ponds was designed to incorporate the Town's minimum standard side slopes of 4:1 and the 7:1 safety shelf everywhere possible, as physical constraints and storage requirements would allow. All of the ponds have been designed to meet all of the Town's standard grading requirements, while ponds 6 and 9 present the challenge of retaining existing lot grades, while also providing the new required storage volumes and pond functionality. The ponds were forced to become predominantly longer in order to maximize the usable land for pond storage between existing lots.

7.6.3. Emergency Overflow Spillways

An emergency spillway has been designed for each of the proposed SWM ponds in the event that any of the outlet structures of the ponds become clogged. As per Town design standards, pond emergency spillways are to convey a minimum of 0.1 $m^3/s/ha$. **Table 7.20** summarizes the required emergency spillway capacity for each pond, as per Town standards. The design of each emergency spillway is described in the following **Sections 7.6.3.1** to **7.6.3.4**.

Table 7.20 – Required Emergency Spillway Capacity

SWM Pond	Drainage Area (ha)	Flow Capacity (m^3/s)
Pond 4	48.58	4.86
Pond 6	48.38	4.84
Pond 8	15.94	1.59
Pond 9	16.41	1.64

7.6.3.1 Pond 4 Overflow

Pond 4 currently spills to the Davis Drive ditch north of the pond, and ultimately to an existing culvert which conveys flows across Davis Drive. However, a defined spillway structure is not currently provided at the existing Pond 4. Under proposed conditions, the emergency spillway is to continue discharging to the Davis Drive ditch and existing culvert. However, a 25 m wide emergency spillway is proposed for Pond 4 at a spill elevation of 271.70, for which the flow depth provided by the weir is 0.40 m between 271.70 and 272.10. The capacity of the proposed weir was modeled using FlowMaster. The FlowMaster output is provided in **Appendix H**. As indicated in the FlowMaster model, the resulting depth of flow at the required flow of 4.86 m^3/s is at 0.24 m, which is within the total provided flow depth of 0.40 m. Therefore, the proposed emergency spillway weir at Pond 4 provides adequate capacity to convey the required flow of 4.86 m^3/s, as required by Town standards.

An emergency culvert is also proposed at Pond 4 in the event that the proposed 1200 mm ø pipe which discharges flows from Pond 4B to Pond 4A becomes clogged. Similar to the emergency spillway, the emergency culvert was designed to convey a flow of 0.1 $m^3/s/ha$. Therefore, as 12.39 ha drains to Pond 4B, the proposed culvert was designed to convey 1.24 m^3/s. In order to convey this flow, twin 910 by 610 mm box culverts are proposed to discharge flows from Pond 4B to Pond 4A. The proposed box culverts are 20 m in length at 1.0% slope. The proposed twin culverts were sized using a CulvertMaster model, for which the output is also provided in **Appendix H**.

7.6.3.2 Pond 6 Overflow

Pond 6 currently spills to the east to existing Pond 9. Under proposed conditions, the emergency spillway is to continue discharging to Pond 9. A 15 m wide emergency spillway is proposed for Pond 6 at a spill elevation of 267.15, for which the flow depth provided by the weir is 0.35 m between 267.15 and 267.50. The capacity of the proposed weir was modeled using FlowMaster. The FlowMaster output is provided in **Appendix H**. As indicated in the FlowMaster model, the resulting depth of flow at the required flow of 4.84 m^3/s is at 0.33 m, which is within the total provided flow depth of 0.35 m. Therefore, the proposed emergency spillway weir at Pond 6 provides adequate capacity to convey the required flow of 4.84 m^3/s, as required by Town standards.

7.6.3.3 Pond 8 Overflow

Pond 8 currently spills to the south to existing residential lots on Glenway Circle adjacent to Pond 8, and ultimately to Pond 9 via Eagle Street. It should be noted that a defined spillway structure is not currently provided at existing Pond 8. Under proposed conditions, the emergency spillway is to discharge directly to Eagle Street to the east of the pond. A berm is proposed along the south side of the pond, adjacent to existing residential lots, at an elevation of A 12 m wide emergency spillway is proposed for Pond 8 at a spill elevation of 272.55. As the existing road elevations at this location on Eagle Street are higher than the spill elevation of Pond 8, the discharge from the pond will back up along Eagle Street in a northerly direction until it reaches an elevation of 272.81, where it will continue to back up along Millard Avenue West in an easterly direction. Once it reaches the spill elevation of 272.87 on Millard Avenue West, the flow will discharge to Proposed Street D to the south. Ultimately, this flow will be conveyed to Pond 9 along Proposed Street D. Due to the existing road elevations being higher than the top elevation of Pond 8, it is not feasible to model this spillway as a typical weir in FlowMaster. However, the drainage conditions at Pond 8 are improved as the spillway is no longer proposed to discharge directly to residential lots to the south of the pond.

7.6.3.4 Pond 9 Overflow

Pond 9 currently spills to the south to existing residential lots adjacent to Pond 9. Under proposed conditions, the emergency spillway is to discharge to Eagle Street east of the pond. A 70 m wide emergency spillway is proposed for Pond 9 at a spill elevation of 268.01, for which the flow depth provided by the weir is 0.14 m between 268.01 and 268.15. The capacity of the proposed weir was modeled using FlowMaster. The FlowMaster output is provided in **Appendix H**. As indicated in the FlowMaster model, the resulting depth of flow at the required flow of 1.64 m^3/s is at 0.12 m, which is within the total provided flow depth of 0.14 m. Therefore, the proposed emergency spillway weir at Pond 9 provides adequate capacity to convey the required flow of 1.64 m^3/s, as required by Town standards.

7.7. Water Quality

Stormwater treatment must meet the Town's criteria of Enhanced (Level 1) Protection quality treatment as defined by the MOE SWMPD Manual (2003). The existing ponds were originally designed to provide quantity control but not quality control. It is proposed that the existing ponds remain as wet pond facilities and be retrofitted to meet current MOE SWM pond guidelines for both quantity and quality control. Minor storm drainage to Ponds 4, 6, 8 and 9 is to be treated by the proposed retrofitted wet pond facilities.

7.7.1. Permanent Pool

The permanent pool depth of the existing ponds are unknown, thus the current quality control capabilities of the ponds cannot be confirmed. The permanent pool storage volumes for the proposed retrofitted SWM ponds required to meet the MOE Enhanced Protection quality control criteria are shown in **Table 7.21**. It has been assumed that quality control is being provided only for the areas draining directly into each pond. External catchments that pass through other existing ponds with no proposed development, i.e. ponds west of the hydro corridor, are assumed to be treated by those existing ponds west of the corridor. Detailed permanent pool calculations are provided in **Appendix H.**

Table 7.21 – Water Quality Requirements: SWM Ponds

SWM Pond	Total Drainage Area to SWM Pond (ha)	% Impervious	Required Permanent Pool Volume (m^3)	Minimum Required Extended Detention Volume (m^3)
Pond 4	24.15	65.0	4,204	966
Pond 6	43.23	66.0	7,624	1,729
Pond 8	17.21	65.0	2,996	688
Pond 9	15.14	67.0	2,704	606

Table 7.22 – Permanent Pool Summary

SWM Pond	Permanent Pool Required (m^3)	Max. Depth of Permanent Pool (m)	Permanent Pool Volume Provided (m^3)	Permanent Pool Elevation (m)
Pond 4	4,200	2.5	5,252	269.70
Pond 6	7,624	2.0	9,912	265.10
Pond 8	2,996	2.5	4,085	269.90
Pond 9	2,704	2.0	6,952	264.45

The proposed retrofitted ponds have been reshaped to account for permanent pool storage as well as active storage. The permanent pool portion of each pond has been designed to MOE standards and includes a berm separating the forebays from the rest of the permanent pool. The required and provided permanent pool for the ponds is shown in **Table 7.22**. Sufficient permanent pool has been provided to exceed the required volume for each pond, which therefore meets quality control requirements, as per MOE Level 1 protection criteria.

7.7.2. Forebay Sizing

Forebay sizing calculations were undertaken to confirm the forebay dimensions required to conform to the quality control criteria. A minimum required length to width ratio of 2:1 was applied in order to comply with MOE and Town's design criteria. A maximum permanent pool depth of 2.5 m was applied for the retrofitted SWM ponds where space was not limited. The forebay sizing requirements for all SWM ponds are summarized in **Table 7.23**, for which the detailed sizing calculations are provided in **Appendix H**.

Table 7.23 – Forebay Sizing Requirements

SWM Pond	Minimum Forebay Length for Settling - V_S = 0.0003 m/s (m)		Minimum Dispersion Length (m)		Minimum Bottom Width (m)	
	Required	Provided	Required	Provided	Required	Provided
Pond 4	A-37.4 B-45.8	A-60 B-90	A-16.2 B-32.3	A-60 B-90	A-2.0 B-4	A-5 B-5
Pond 6	36.2	60	54.3	60	6.8	18
Pond 8	18.8	36	21.0	36	2.6	15
Pond 9	21.8	38	19.6	38	2.5	11

7.7.3. Phosphorus Loading

The proposed development will change the runoff characteristics of the site and will result in an increase in phosphorus loading to the watershed. A portion of the subject site (Pond 4) is situated in the West Holland subwatershed and a portion of the site is in the East Holland subwatershed (Ponds 6, 8 and 9).

LSRCA's recent study on phosphorus loading to Lake Simcoe (Estimation of the Phosphorus Loadings to Lake Simcoe, September 2010) indicates that in the East Holland Creek watershed the annual phosphorus loading rates in a growth scenario (for conservative calculation) are as summarized in **Table 7.24**.

Table 7.24 – Phosphorus Loading

Land Use	Pre-Development Area (ha)	Pre-Development Phosphorus Load (kg/year)	Post-Development Area (ha)	Post-Development Phosphorus Load (kg/year)	SWM Reduction (%)	Post-Development Phosphorus Load After SWM (kg/yr)
Grass / Pasture	2.0	0.24	1.5	0.18	63	0.07
Commercial / Industrial	9.8	17.87	9.7	17.62	63	6.52
High-Density Residential	47.7	63.04	73.7	97.32	63	36.01
Open Water	1.5	0.38	4.5	1.17	63	0.43
Golf Course	37.0	8.87	8.6	2.06	63	0.76
TOTAL	**98.0**	**90.40**	**98.0**	**118.35**	**63**	**43.79**

The wet ponds will be accounted to remove 63% of phosphorus on the site. Previously, wet ponds could be assumed to remove 80% phosphorus (LSRCA SWM Technical Guidelines, 2010), however this has been changed since the Lake Simcoe Protection Plan (October, 2011) has been introduced. New guidelines have been set for phosphorus removal targets, removal efficiencies and loading rates. A phosphorus loading and removal tool has been developed by the LSRCA and MOE and was used for the purposes of this development. The phosphorus removal calculation sheet is provided in **Appendix I**. Phosphorus loading for the development must meet Post to Pre-development conditions and are summarized in **Table 7.24**.

Further removal of phosphorus may be achieved through infiltration techniques, such as low impact development (LID) practices, which may be located throughout the Site. For example, the following measures could be used to achieve the further reduction:

- Bioswales;
- Infiltration trenches;
- Tree pits and/or extended curbs; and/or,
- Vegetated filter strips.

It is noted that phosphorus loading reduction through the use of traditional oil / grit separators are generally not accepted without supporting studies. Phosphorus loading calculations are to be confirmed based on LID practices proposed at detailed design.

7.8. Extended Detention

For outlet erosion control, the 24 hour detention of the 25 mm four (4) hour Chicago Storm is targeted for additional quality control measure as required by MOE SWM guidelines. A bottom draw orifice plate system is proposed to control the extended detention portion of each pond's active storage.

The existing ponds do not account for any 24 hour detention storage as a quality control feature. The 25 mm Chicago Storm rainfall event is used to determine the runoff volumes required for detention storage, which dictates the height of the water above the orifice. The 25 mm VO2 output can be found in **Appendix G**.

Pond 4 and the proposed controls for that pond will be used for the example calculation of the detention time met for each pond. Water stored in the extended detention portion of the pond is to be controlled by a 230 mm diameter orifice plate at an invert elevation of 269.70 m. Calculations were undertaken to confirm that extended detention would occur for a minimum of 24 hours using *equation 4.11* of the MOE SWM Planning and Design Manual.

$$t = \frac{0.66C_2h^{1.5} + 2C_3h^{0.5}}{2.75A_O}$$

Where:

A_o = Cross-sectional area of orifice ([Pi * (0.23m/2)^2], m^2)
C_2 = Slope co-efficient from the area-depth linear regression (2245)
C_3 = Intercept from the area-depth linear regression (5795)
h = Maximum water elevation above center-line of orifice (0.65 m)
t = 24.06 hr

With the calculated extended detention time of 24.06 hours, the proposed orifice plate meets the 24 hour minimum detention time requirements. **Table 7.25** summarizes the 24 drawdown capabilities of the proposed ponds and controls.

Table 7.25 – Drawdown Time: SWM Ponds

SWM Pond	Bottom Draw Orifice Size (mm)	Slope Coeff. (C2)	Y-Intercept (C3)	Maximum Depth of Detention Storage (m)	Drawdown Time (hr)
Pond 4	200	2260	5405	0.60	29.12
Pond 6	270	1845	7885	0.70	24.54
Pond 8	160	1122	3517	0.75	33.02
Pond 9	200	1598	5959	0.40	25.09

It can be seen from **Table 7.25** that all ponds have been upgraded to meet the MOE recommended drawdown time of 24 hours for the 25 mm storm event.

7.9. Water Balance Mitigation

As per the *Hydrogeological Investigation* prepared by Cole Engineering, dated November 2013, a water budget was completed in order to compare the long-term impacts to the local groundwater conditions as a result of the proposed development. The results of this water balance analysis in the *Hydrogeological Investigation* indicate that the annual infiltration is decreased by 5,763 m^3/year (5.3%), due to the increase in impervious area from 42% to 58%. The decrease in infiltration will require mitigation measures in order to reduce the impact to the existing groundwater conditions.

Due to the existing soil conditions and high groundwater levels, the application of typical infiltration measures (ie. infiltration trenches) is not feasible for this site. As per requirements provided in the *Stormwater Management Planning and Design Manual* prepared by the Ministry of the Environment (MOE), the groundwater table must be a minimum of 1 m from the bottom of any infiltration facility. Infiltration facilities also typically require frost cover (minimum of 1.2 m) if the facility involves any exfiltration pipes. As noted in Table 2 of the *Hydrogeological Investigation*, the depth of groundwater from existing ground ranges from 0.1 m at MW-4D to 2.4 m at MW-4S, with an average depth of 1.2 m. Therefore, these groundwater depths are not suitable to accommodate any infiltration facility below ground. In lieu of proposing typical infiltration measures below ground, it is proposed that the depth of topsoil be increased where possible within parks, boulevards and lots, depending on the existing soil conditions.

It is indicated in the *Hydrogeological Investigation* that the existing soil type is predominantly silty clay. As per the *Stormwater Management Planning and Design Manual*, a percolation (or infiltration) rate of 15 mm/hr is required for a soil to be suitable for infiltration purposes. Table 4 of the *Hydrogeological Investigation* provides the hydraulic conductivity recorded at each of the monitoring wells. *Table C 2* of the *Toronto and Region Conservation Authority Stormwater Management Criteria* (TRCA, August 2012) provides a direct correlation between hydraulic conductivity and percolation rate, provided in **Appendix J**. It was determined from Table C 2 that the MOE requirement of a percolation rate of 15 mm/hr is equivalent to a hydraulic conductivity of $2.5x10^{-8}$ m/s. As noted in Table 4 of the *Hydrogeological Investigation*, the soils are not suitable for infiltration at the locations of MW-3S and MW-4D. Therefore, due to poor soil conditions, it is proposed that topsoil will not be increased at these locations since the conditions for infiltration are inadequate.

8.0 Conclusions and Recommendations

Based on our review and analysis, we conclude the site is readily serviceable and provide the following summary and recommendations:

Grading

The proposed road and lot grading scheme follows Town's Engineering Design Standards and respects the perimeter grades of the surrounding properties. The use of retaining walls within proposed lots will be minimized, however final heights and alignment will be determined at the detail design stage. Due to the significant grade differences across certain portions of the proposed development area, the use of Walk-Out and Front Walk-Up lot grading types are proposed. The final grading design will seek to preserve existing perimeter trees in accordance with the Tree Inventory and Preservation Report.

The proposed grading respects the existing and proposed drainage patterns as defined in the stormwater management section of this report. Conceptual grading designs have been presented for all medium density and high density residential blocks, in addition to municipal roads and lots.

Water Supply

New watermains shall be constructed along all proposed municipal roads and private roads. One water supply connection shall be permitted from the municipal watermain to the private Medium/High Density or Condo Blocks. A new watermain along the south side of Davis Drive will be required external to the proposed development to provide looping and supply security to Street B from Crossland Gate/Alex Doner Drive.

A water system hydraulic analysis was completed to demonstrate adequate flow and pressure within the existing water distribution network to service the proposed development and determine preliminary watermain sizes for new mains. The proposed system pressures are between 441 kPa and 680 kPa for the areas to be connected to the Newmarket West Pressure District under normal operation. The pressure is within the system operational pressures as suggested by MOE 2009 but higher than the Town's suggested operational pressure. The proposed system pressures are between 275 kPa and 390 kPa for the areas to be connected to Newmarket Central district under normal operation. The pressure is within the system operational pressures as suggested by MOE 2009 but lower than the Town's suggested operational pressure. Sufficient system pressure (higher than 14 m or 200 kPa) can be maintained within the proposed development under the fire condition.

The boundary water supply conditions should be provided by the Town to verify the results of the preliminary hydraulic model. A detailed hydraulic analysis of the water supply system will be performed during the design stage.

Storm Drainage

Storm water conveyance will be accomplished by constructing new sewers through areas of proposed development with sewers designed to capture and convey the 5-year storm runoff. Storm sewers shall be oversized to accommodate the capture and conveyance of major system storm flows at locations where public road drainage is directed through private property. Existing storm sewer infrastructure has been analyzed for conveyance capacity where new storm connections are proposed from proposed development areas. The expected hydraulic grade line within proposed storm sewers has been analyzed in key areas where stormwater management ponds exhibit high operating water levels. Lot servicing via gravity foundation drains will be feasible for the majority of the proposed development with two small pockets requiring the use of sump pumps, specifically proposed Lots 1 to 6 along Alex Doner Drive and approximately 10 lots on the southern end of Street D, near stormwater management pond 9.

Sanitary Sewers

New sewers will be required to service the proposed development areas and shall be designed in compliance with current Town standards. The proposed development will generate a peak sanitary flow rate of 34.4 L/s at the existing sanitary outlet just downstream of Peevers Crescent, based on the combined total population peaking factor for the entire Glenway Community. A sanitary flow monitoring program was completed from June 2010 to December 2010 to measure actual sanitary flow within the existing sewers downstream of the Glenway Community within existing MH110A. The monitoring program revealed that calibrated peak sanitary flows from the Glenway Community (61.9 L/s, 100-year storm) are significantly lower than the original theoretical sewage generation rate of 177 L/s based on the original subdivision design sheets prepared by G.M. Sernas, dated January 1995. Under post development conditions, the expected peak sanitary flow rate at ex. MH110A is 96.3 L/s (34.4 L/s + 61.9 L/s) which is less than the original theoretical design flow rate. In addition, the existing 450mm diameter sanitary sub-trunk at 0.34% grade downstream of Peevers Crescent exhibits a full flow capacity of 166.2 L/s, therefore the additional sanitary flow can be accommodated by the local downstream sanitary sub-trunk system.

With respect to downstream sewer capacity within the Western Sub-Trunk, an updated analysis of R.V. Anderson's theoretical model was completed to calculate the increased peak flows and surcharging conditions within the downstream Sub-Trunk due to the proposed development. Additional peak flows within the Sub-Trunk were calculated at 27.3 L/s at the Newmarket Sewage Pumping Station, which represented an approximate increase of 4% of total Sub-Trunk flows.

Stormwater Management

A SWM plan is proposed to reduce the increase in runoff volumes and peak flows as a result of change in land use for the proposed development. In order to meet the design criteria set forth by the Town, LSRCA and the MOE, quantity and quality control measures are proposed.

As part of LSRCA requirements and the Lake Simcoe Protection Plan, measures have been taken to reduce the phosphorus loading from the new development through the use of wet SWM ponds, which provide 63% removal efficiency. This alone is enough to not only meet pre development loading rates, but also reduce them by 50%.

Four (4) SWM pond facilities are proposed to meet quantity and quality requirements of the development by upgrading and expanding the four (4) existing SWM ponds onsite. There are two (2) main outlets from the site. The first is located adjacent to Pond 4 (north end of the site), discharging directly to the Davis Drive road side ditch. The second is the Eagle Street storm sewer at Crossland Gate which directs stormwater southerly from the site, received flows from Ponds 6, 8 and 9. Quantity control targets were set to meet pond outflow rates under existing conditions by using the Town's Standard 24-hour SCS Design Storms. Quality control targets were based on MOE Level 1 protection and assumed the existing ponds had no quality treatment as part of the original design. The proposed SWM pond upgrades include providing sufficient treatment capacity to account for both proposed and existing residential development. Storm drainage from the proposed development area is directed to the proposed upgraded SWM ponds, including areas that currently flow uncontrolled offsite under existing conditions. The upgraded SWM ponds have also been redesigned to the Town of Newmarket standard for grading, storage depth and volume requirements.

Yours truly,

COLE ENGINEERING GROUP LTD.

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PS:si

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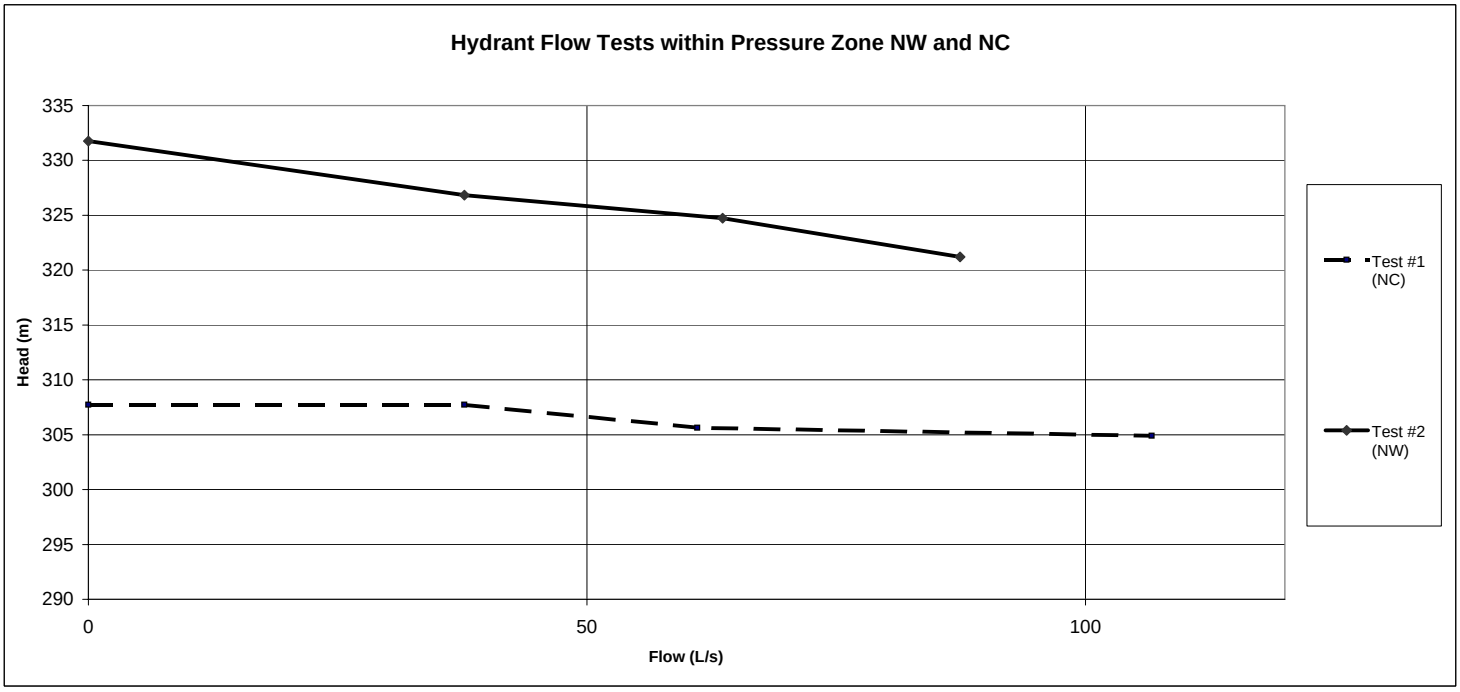
APPENDIX A.1
Water Distribution Systems

Appendix A_1 Fire Flow Test Analysis

Project: Marianneville Glenway L10-523
Date: Feb 30 2012
File:L09-301 fire flow estimation.xls

Test No	Location for Pressure Measurement	Location for Flow	Date/Time	Elevation (m)	Flow		Pressure		Head (m)
					UPGPM	L/s	(psi)	(m)	
Test #1 (NC)	1st Hydrant at Alex Doner Dr & Crossland Gate	1st Hydrant at Alex Doner Dr & Crossland Gate	Oct 6 2009 9:00 am	269	0	0	55	39	308
(in Newmarket Central Pressure District)					597	38	55	39	308
					967	61	52	37	306
					1688	107	51	36	305
Test #2 (NW)	371 Amberlee Ct.	381 Amberlee Ct.	Oct 15 2009 9:00 am	286	0	0	65	46	332
(in Newmarket West Pressure District)					597	38	58	41	327
					1007	64	55	39	325
					1384	87	50	35	321



Appendix A-1 Test #1 Field Data (1 of 2)

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Test #1

WATER SUPPLY TEST

Name of risk: ..... File No.: .....

Address: Alex Doner Dr. at Crossland Ct. Test by: AFTI

Municipality: NEW MARKET, ONT. Date: Oct. 6 2009

SYSTEM DATA:

Size of Main: 8" Dead End: ..... Two Ways: ✓ Loop: .....

Source Reliable: Yes If not explain: .....

Comments: .....

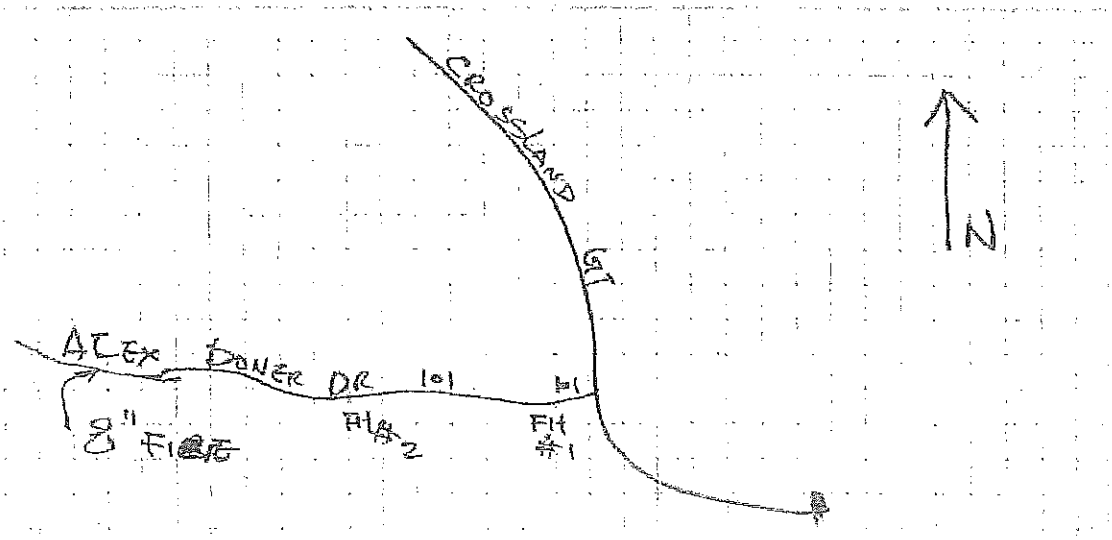
TEST DATA:

Location of test fire hydrants; Residual: #1 1st FH. at Alex Doner Dr. & Crossland Ct.

Flow: #2 2nd FH. " "

Static pressure 55 psi Time: 9:00 A.M. — P.M.

Test No.	No. of Outlets	Orifice Size (in.)	Pitot Reading (psi)	Equivalent Flow gpm (U.S.)	Total Flow gpm (U.S.)	Residual Pressure (psi)	Comments
1	1	1¾	43	599	597	55	0.997
2	1	2½	42	1209	967	52	0.8
3	2	2½	32	1055, 1055	1688	51	0.8
4							



Sketch by: R W.

Scale: NTS

Name and address of municipal authority who should receive a copy.

PUC

STATIC: 55 PSI

(1) 597 USGPM@ 55 PSI

(2) 967 USGPM@ 52 PSI

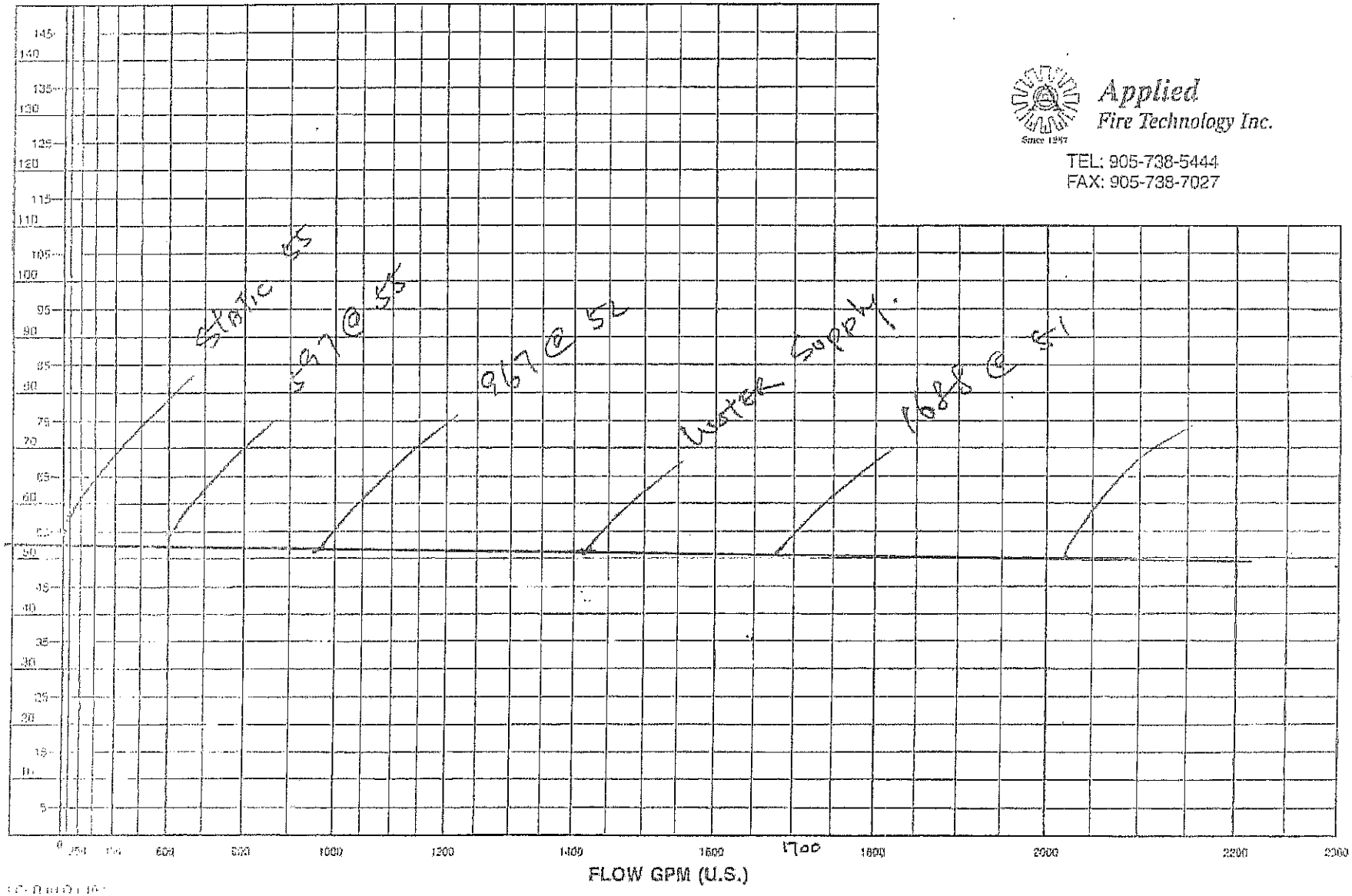
(3) 1688 USGPM@ 51 PSI

NAME OF RISK: _____ FILE NO.: _____

STREET: ALEX DONER DR & CROSSLAND GT.

CITY: NEW MARKET, ONT.

DATE: OCT. 6. 2009 BY: AFTI



Applied
Fire Technology Inc.
Since 1997
TEL: 905-738-5444
FAX: 905-738-7027

Appendix A-1 Test #1 Field Data (2 of 2)

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Appendix A-1 Test #2 Field Data (1 of 2)

Test # 2

WATER SUPPLY TEST

Name of risk: ..... File No.: .....

Address: 381 AMBERLEE CT Test by: ART.

Municipality: NEW MARKET, ONT Date: OCT. 15 2009

SYSTEM DATA:

Size of Main: 6" Dead End: ..... Two Ways: ✓ Loop: .....

Source Reliable: YES If not explain: .....

Comments: .....

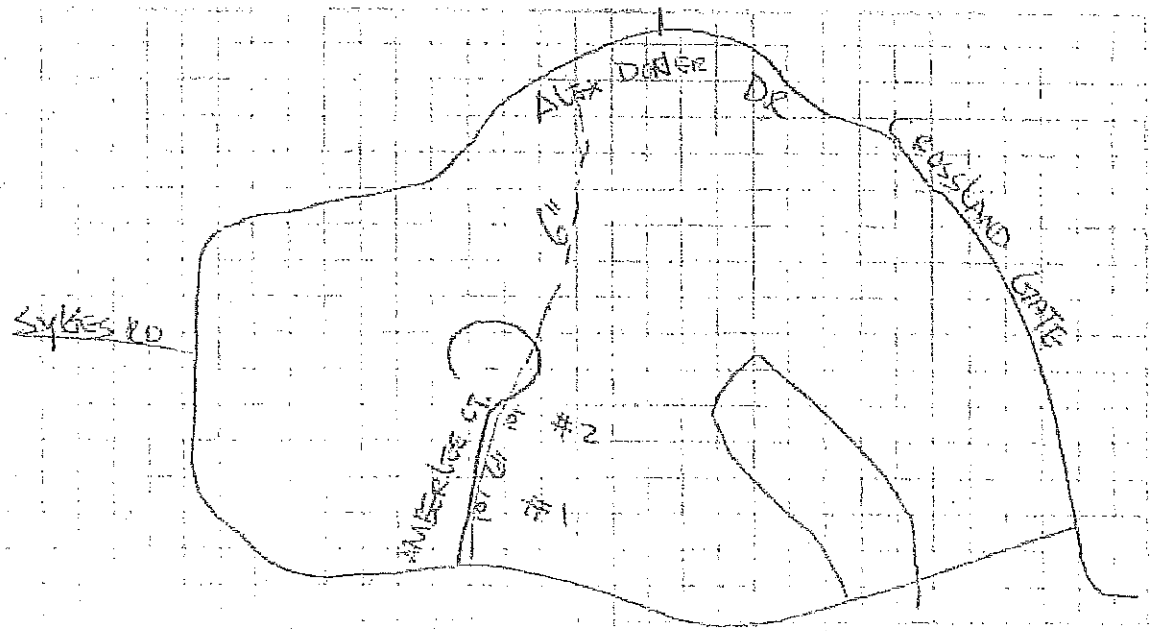
TEST DATA:

Location of test fire hydrants; Residual: #1 371 AMBERLEE CT

Flow: #2 381 AMBERLEE CT

Static pressure: 65 psi Time: 9:00 A.M. — P.M.

Test No.	No. of Outlets	Orifice Size (in.)	Pitot Reading (psi)	Equivalent Flow gpm (U.S.)	Total Flow gpm (U.S.)	Residual Pressure (psi)	Comments
1	1	1¾	43	599	597	58	0.997
2	1	2½	36	1119	1007	55	0.9
3	2	2½	17, 17	769, 769	1384	50	0.9
4							



Sketch by: RW.

Scale: NTS

Name and address of municipal authority who should receive a copy.

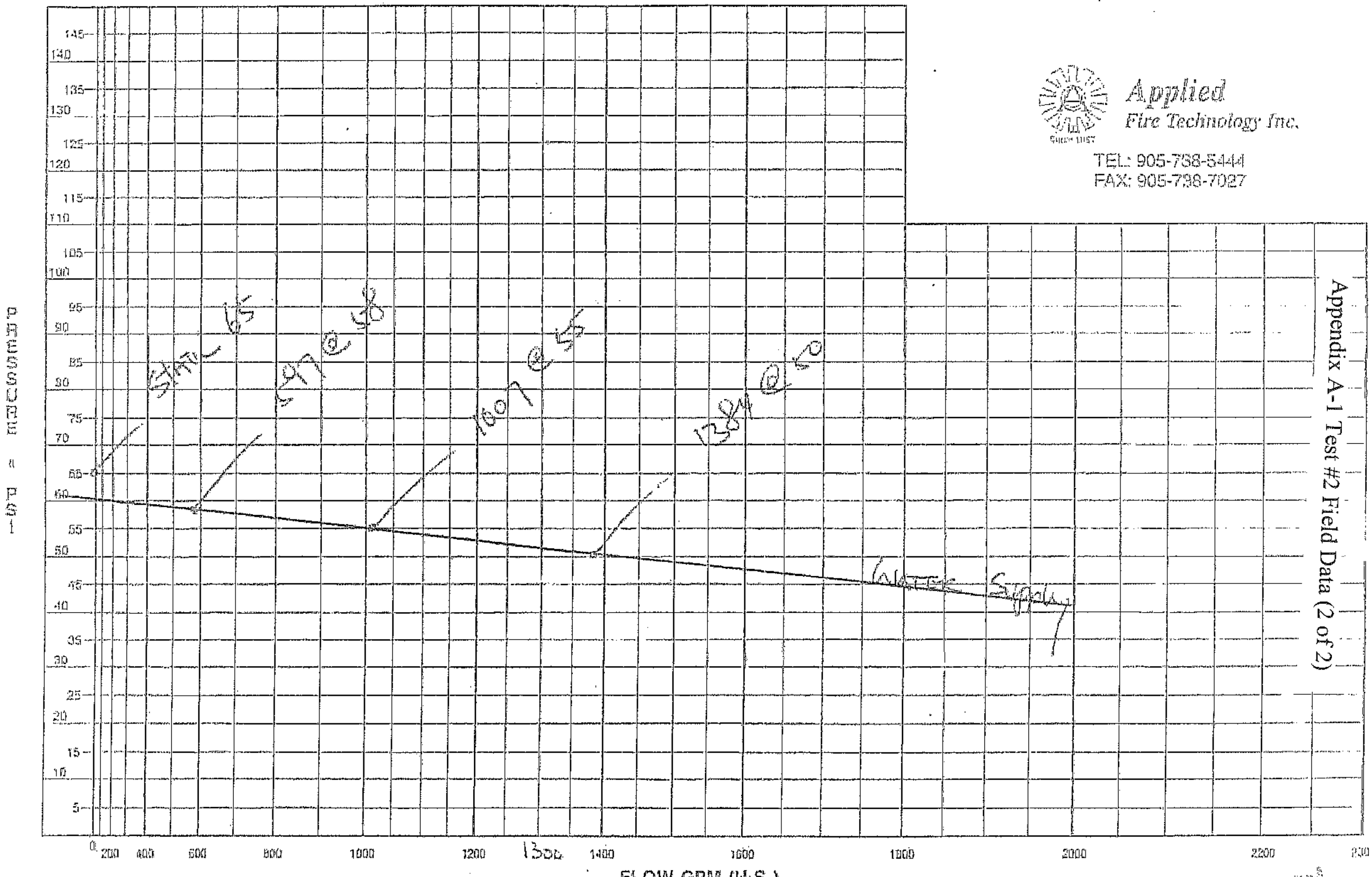
PUC

Appendix A-1 Test #2 Field Data (2 of 2)

STATIC: 65 PSI
(1) 597 USGPM@ 58 PSI
(2) 1007 USGPM@ 55 PSI
(3) 1384 USGPM@ 50 PSI

NAME OF RISK: ______ FILE NO.: ______
STREET: 381 AMBERLEE CT
CITY: NEWMARKET, ON.
DATE: OCT 15 2009 BY: AFT

Applied Fire Technology Inc.
TEL: 905-738-5444
FAX: 905-738-7027



LCI 07(H.O.) 102

Test #2

Appendix A-2 Fire Flow Estimation for Block 171 Commercial Building

Based on Part II of Water Supply for Public Fire Protection 1999 (Page 17 to 20 Guide for determination of required fire flow)

Project: L09-301
Date: March 2012
File:L09-301_ fire flow estimation.xls

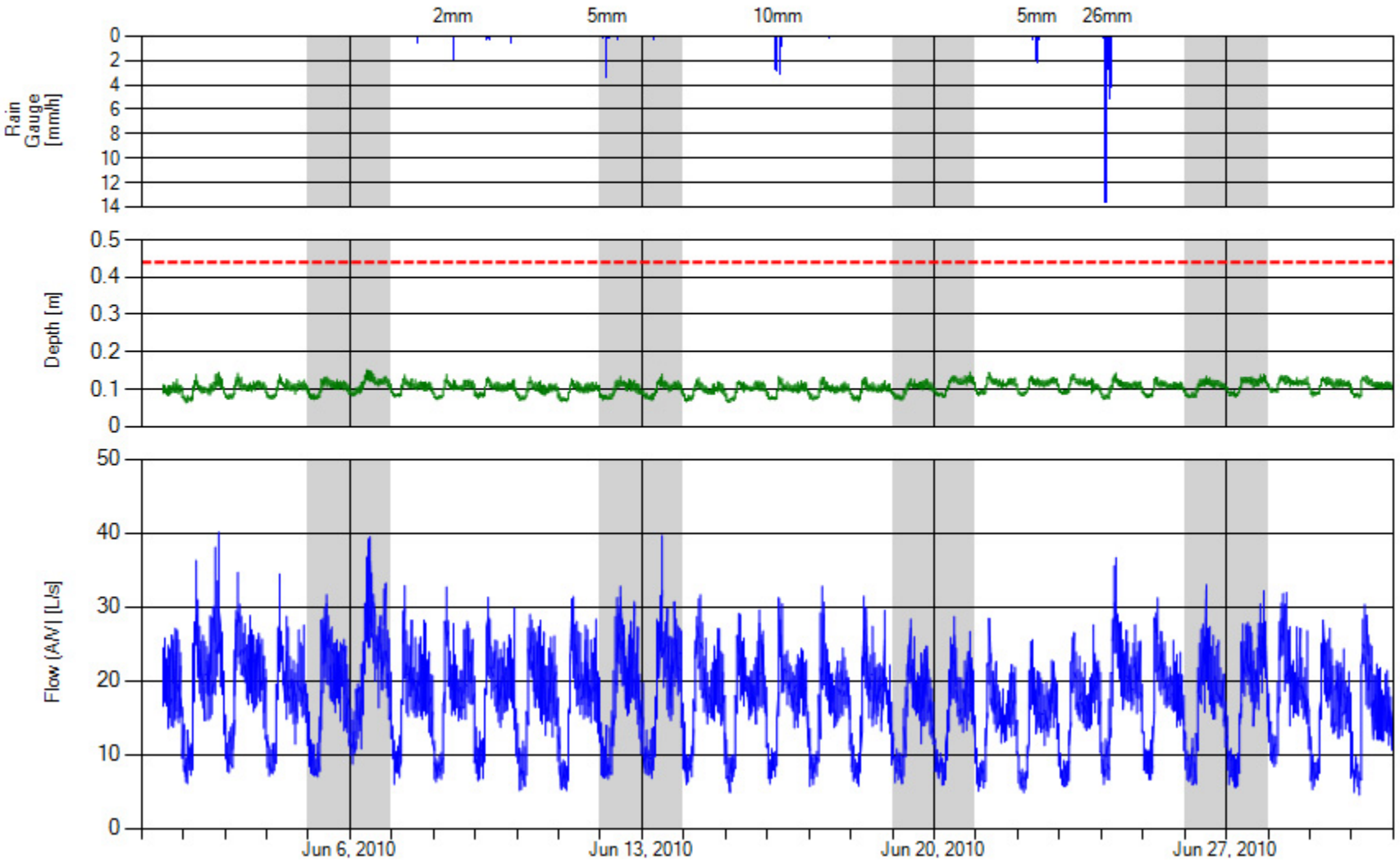
Net floor area 6,000 m2

Item A to D, P20)	Fire flow rate based on type of construction				
Item 1, P17	F1=220C1A^0.5		Fire Flow Formula		(Rounded off to nearest 1000 L/min)
	F1=		Required fire Flow (L/min)		
	A=	6,000 m2	Total Floor area		
		0	Largest one floor area		
		0	Floor Area above		
		0	Floor area below		
	C1 =	0.8	Type of construction (Page 17)		
			C1=1.5	for wood frame construction (structure essentially all combustible)	
			C1=1.0	for ordinary construction (brick or other masonry walls, combustibles floor and interior)	
			C1=0.8	for non-combustible construction (unprotected metal structural components, masonry or metal walls)	
			C1=0.6	for fire-resistive construction (fully protected frame, floors, roof)	
				a) fire-resistive construction with vertical opening inadequately protected:	
	F1=	**13632.9** L/min		two largest floors plus 50% of each of any floors immediately above up to eight	
				B) fire-resistive construction with vertical opening and exterior communications adequately protected (one hour rating):	
				one largest floors plus 25% of each of the two immediately adjoining floors	
Item E, P20)	Determine the increase or decrease for type of occupancies				(Do not round off the answer)
Item 2, P18)					
	F2=	F1 * C2	Adjusted Fire Flow rate (L/s)		
	C2=	-15%	C2=-15%	Limited-Combustible, P18	
	F2=	**11588** L/min	C2=-25%	Non-Combustible, P18	
Item F, P20)	Determine the decrease for automatic sprinkler system protection and standard design				
Item 3, P18)					(Do not round off the answer)
	F3 =	F2 *C3			
	C3=	-30%	C3=-55%	Complete automatic sprinkler System (50%) plus additional 5% for standard design,P18	
	F3=	**-3476** L/min	C3=-30%	Adequately designed System conforming to NFPA 13 and other NFPA standards	
Item G, P20)	Determine the increase for structure exposure distance, P18				(Do not round off the answer)
Item 4, p18)					
	F4 =	F2 *C4	Exposure to the other buildings,		
	C4=	20%	C4 = 0% if >50 m		
	F4=	**2318** L/min	C4 = 20 % (if 3 to 10 m)		
			C4 = 15 % (if 10 to 20 m)		
			C4 = 10 % (if 20 to 30 m)		
			C4 = 5 % (if 30 to 45 m)		
Item H, P20)	Adjust the Fire Flow Value				
	F5=	F2+F3+F4			
	F5=	10429 L/min			
	F5=	10000 L/min			(Rounded off to nearest 1000 L/min)
	F5=	**167** L/s			

APPENDIX A.2
Flow and Precipitation Monitoring Data @ MH110A

MH 110A Flow Monitoring

Jun 1, 2010 - Jul 1, 2010



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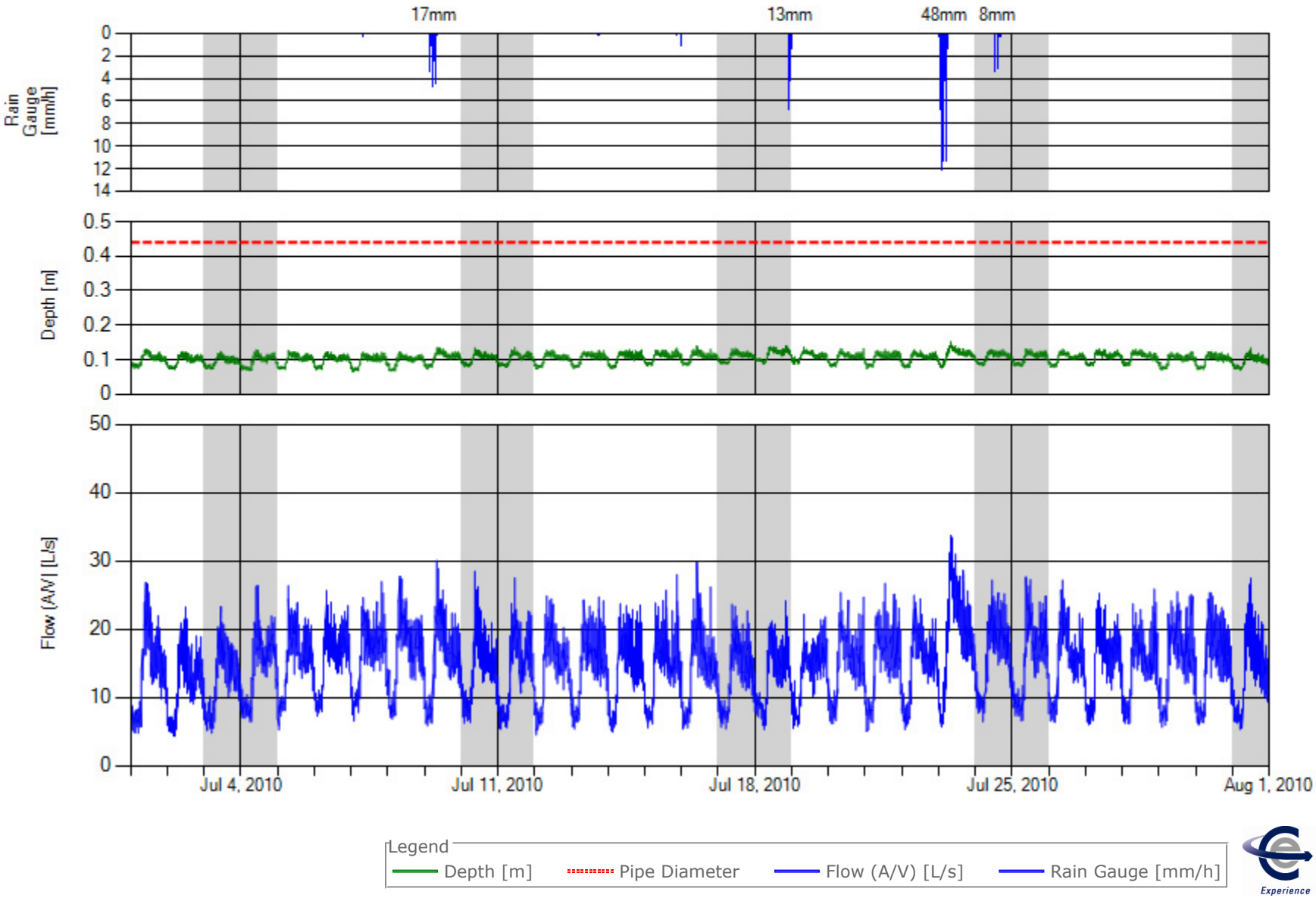
MH 110A Flow Monitoring

Jul 1, 2010 - Aug 1, 2010



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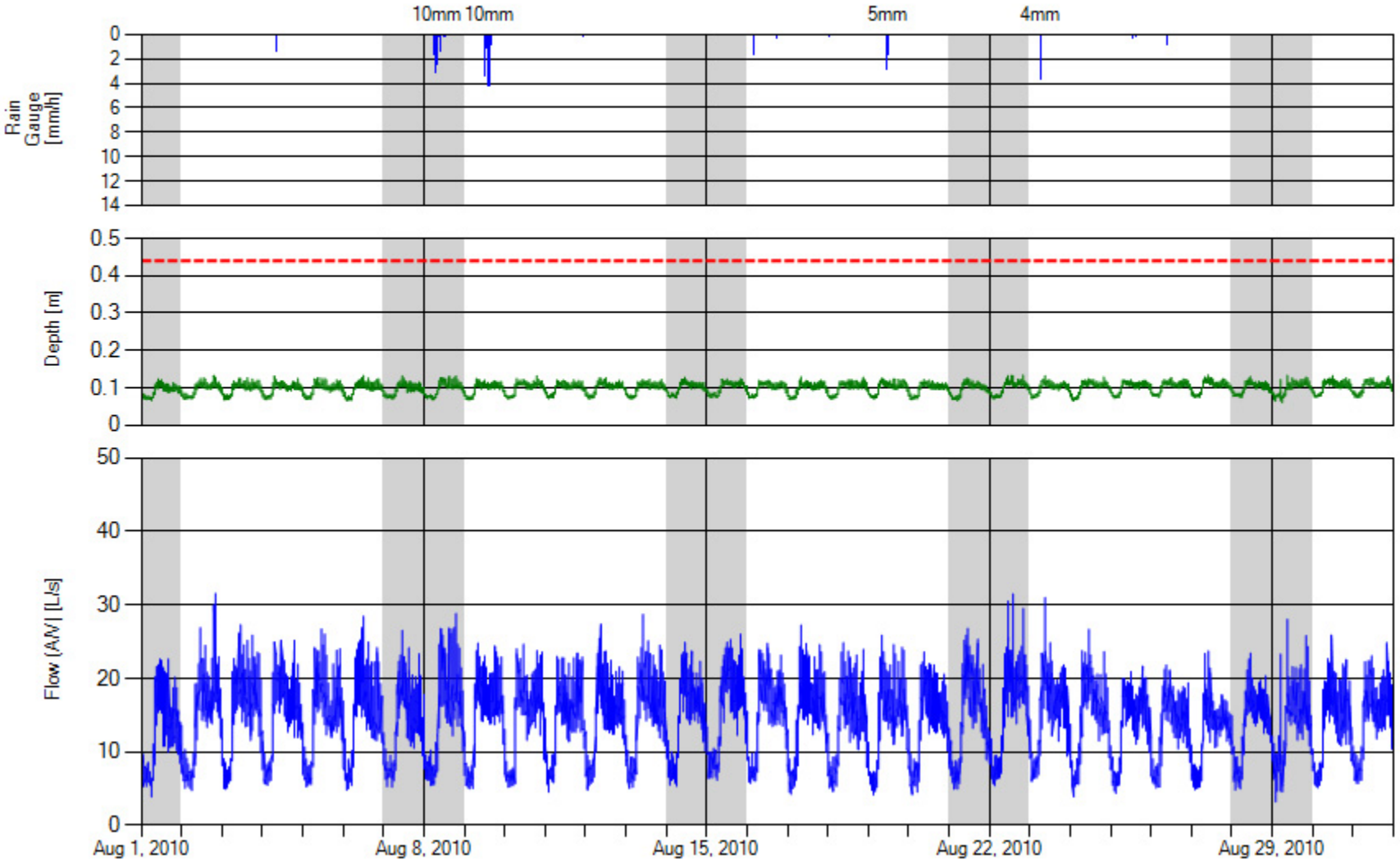
MH 110A Flow Monitoring

Aug 1, 2010 - Sep 1, 2010



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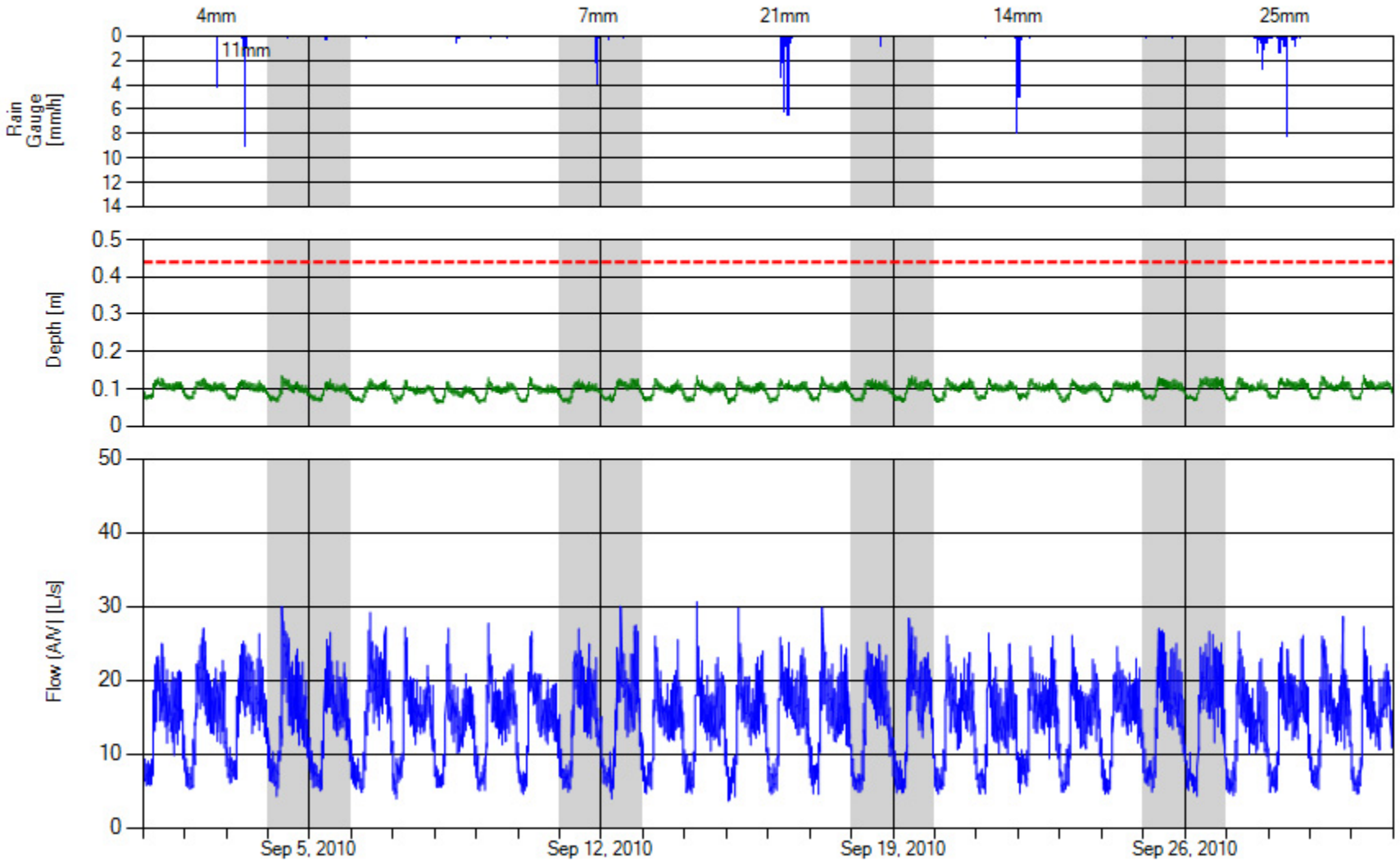
MH 110A Flow Monitoring

Sep 1, 2010 - Oct 1, 2010



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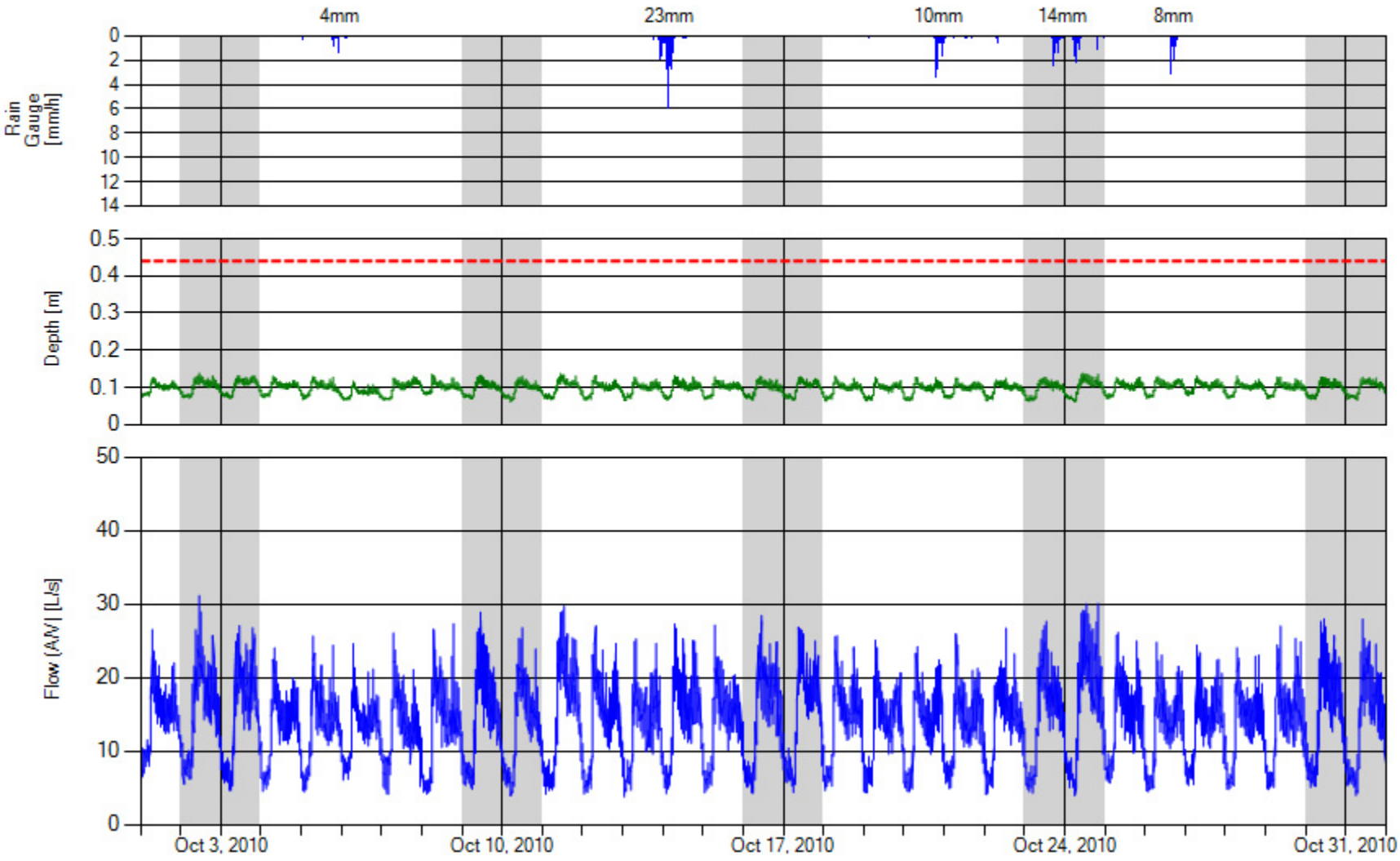
MH 110A Flow Monitoring

Oct 1, 2010 - Nov 1, 2010



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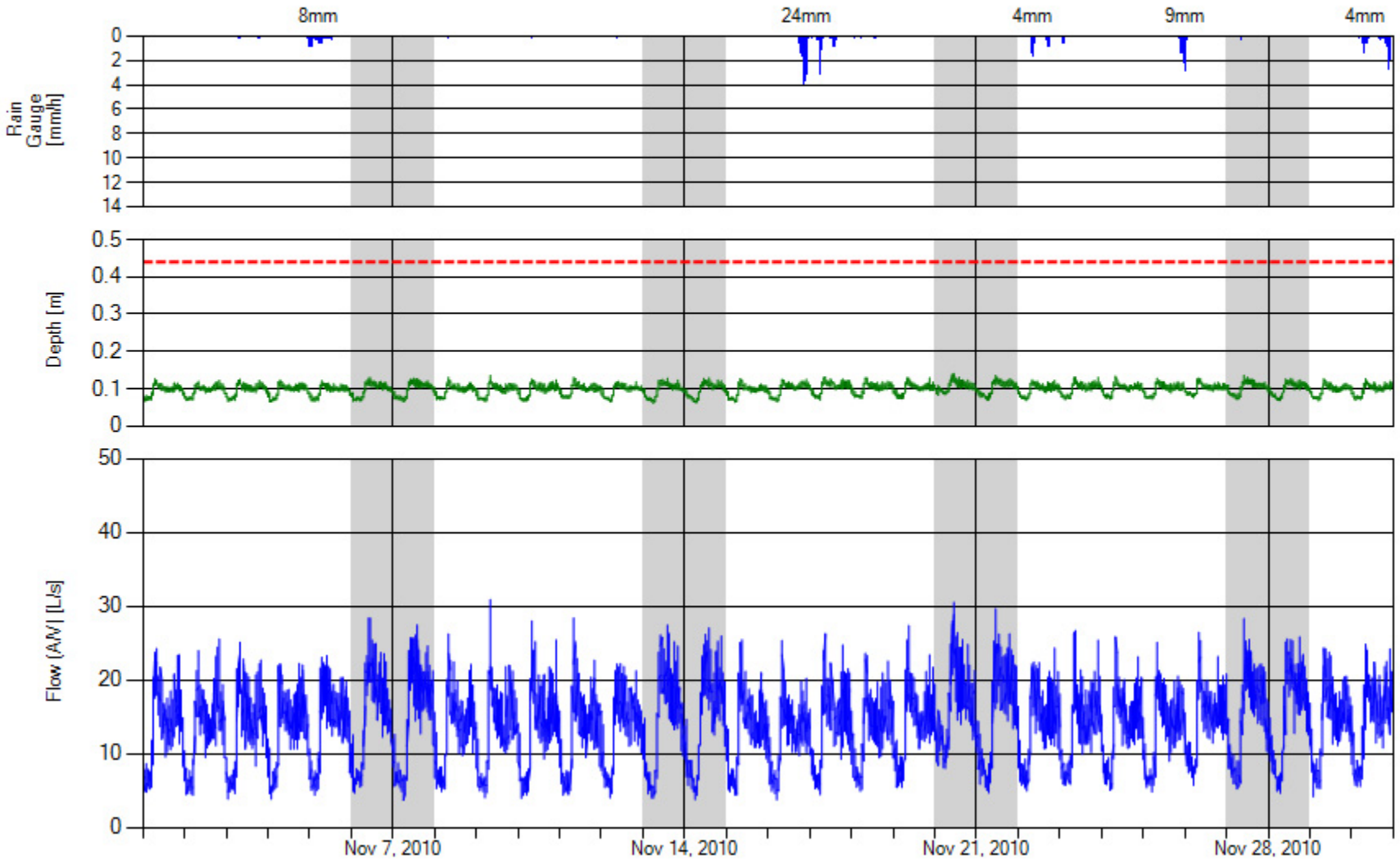
MH 110A Flow Monitoring

Nov 1, 2010 - Dec 1, 2010



* *Possible Partial Storm Event Total*

Legend

Depth [m] | Pipe Diameter | Flow (A/V) [L/s] | Rain Gauge [mm/h]

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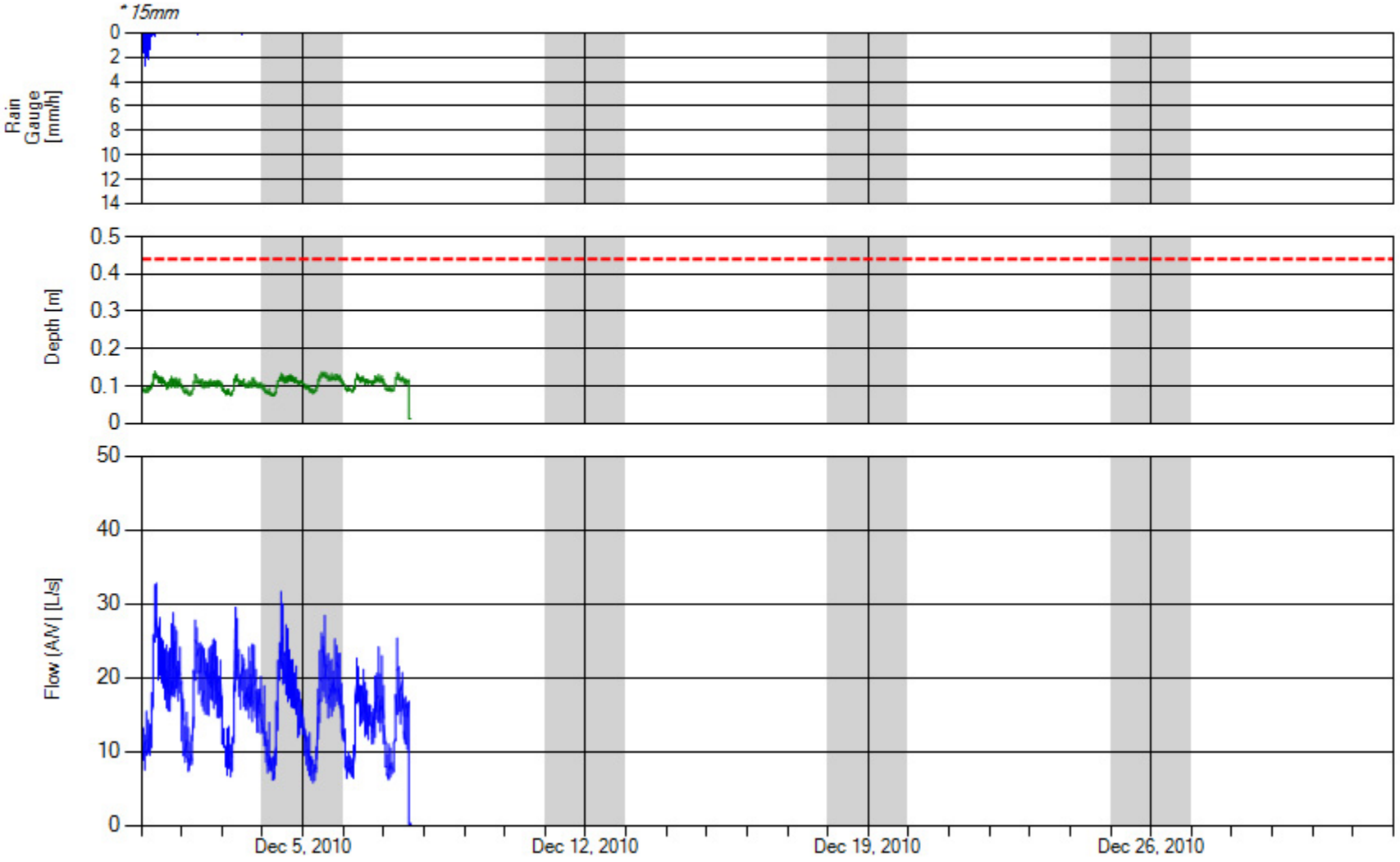
MH 110A Flow Monitoring

Dec 1, 2010 - Jan 1, 2011



* *Possible Partial Storm Event Total*

Legend

Depth [m] | Pipe Diameter | Flow (A/V) [L/s] | Rain Gauge [mm/h]

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APPENDIX A.3

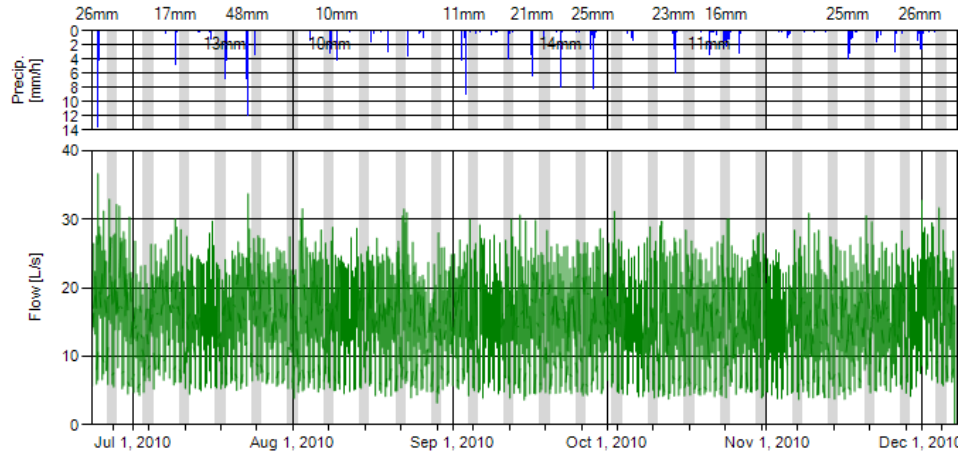
Sanitary Flow Monitoring Analysis Report - 2 Pg. Summary

Sanitary Flow Analysis Report

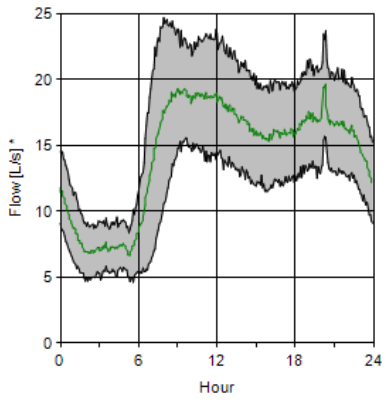
Cole Engineering Automated Analysis System

Project: Marianneville Development
Site: MH 110A
Start: 2010-Jun-23 00:00:00
End: 2010-Dec-07 23:59:59

Measured Flow and Precipitation



Average Daily Dry-Weather Flow



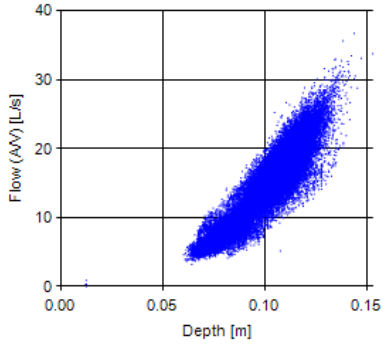
** Highlighting data within 90th percentile (assuming Normal distribution)*

Flow Statistics

Population: 3,216 **Drainage Area:** 85.8 ha **T_C:** 40 min

Name	Value	Normalized
Avg. flow	14.4 L/s	386.7 L/cap/d
Avg. dry-weather flow	14.4 L/s	386.1 L/cap/d
Avg. population DWF	10.1 L/s	272.0 L/cap/d
Avg. daily minimum DWF	5.00 L/s	n/a
Avg. daily peak DWF	26.8 L/s	n/a
Groundwater infiltration	4.25 L/s	4,276 L/ha/d
Measured Harmon peak factor	1.86	n/a
Theoretical Harmon peak factor	3.42	n/a
Harmon correction factor	0.545	n/a
Peak Measured flow	36.68 L/s	n/a
Peak I/I	14.20 L/s	0.1655 L/s/ha
Peak % of precipitation in sanitary	2.12 %	n/a

Scatter Chart



Event Statistics

Event Date	Total Precipitation [mm]	Peak Precip. Intensity over T_C [mm/h]	Measured Peak Flow [L/s]	Peak I/I Flow [L/s]	Time of Peak I/I Flow (T_D)	Time of Peak WWF	Est. DWF at T_D [L/s]	Peak II / Peak DWF	Peak I/I Rate [L/s/ha]	Volume of I/I [m^3]	Volumetric Runoff Coefficient	Peak I/I Coefficient
2010-Jun-24	26	13.0	36.7	12.7	2010-Jun-24 08:45:00	2010-Jun-24 08:45:00	24.0	0.498	0.148	180	0.00793	0.00411
2010-Jul-09	17	6.9	30.1	9.6	2010-Jul-09 08:05:00	2010-Jul-09 08:05:00	20.5	0.439	0.112	82	0.00558	0.00586
2010-Jul-18	13	10.3	22.2	5.2	2010-Jul-19 02:30:00	2010-Jul-19 08:45:00	7.2	0.252	0.061	11	0.00105	0.00213
2010-Jul-23	48	27.4	33.8	14.2	2010-Jul-23 08:25:00	2010-Jul-23 08:25:00	19.6	0.678	0.165	354	0.00855	0.00217
2010-Jul-24	8	5.0	25.3	10.0	2010-Jul-24 15:00:00	2010-Jul-24 15:00:00	15.4	0.466	0.116	142	0.02095	0.00844
2010-Aug-08	10	3.8	28.9	12.7	2010-Aug-08 19:05:00	2010-Aug-08 19:05:00	16.2	0.605	0.148	125	0.01466	0.01396
2010-Aug-09	10	5.3	24.4	8.2	2010-Aug-09 19:50:00	2010-Aug-09 18:55:00	15.4	0.459	0.096	66	0.00757	0.00645
2010-Sep-03	11	10.7	26.3	9.8	2010-Sep-03 19:40:00	2010-Sep-03 19:40:00	16.5	0.491	0.114	100	0.01018	0.00386
2010-Sep-11	7	5.0	30.0	10.0	2010-Sep-12 11:55:00	2010-Sep-12 11:55:00	20.0	0.466	0.117	88	0.01390	0.00848
2010-Sep-16	21	6.5	25.1	9.4	2010-Sep-16 12:10:00	2010-Sep-16 12:10:00	15.8	0.411	0.109	125	0.00699	0.00607
2010-Sep-21	14	11.8	26.0	7.5	2010-Sep-22 19:55:00	2010-Sep-22 20:20:00	16.8	0.342	0.088	95	0.00775	0.00268
2010-Sep-27	25	12.6	26.1	8.0	2010-Sep-28 19:15:00	2010-Sep-28 20:10:00	17.6	0.359	0.093	134	0.00630	0.00267
2010-Oct-13	23	6.5	27.3	10.7	2010-Oct-14 07:05:00	2010-Oct-14 07:05:00	16.6	0.529	0.124	142	0.00715	0.00691
2010-Oct-20	11	3.8	25.9	7.3	2010-Oct-20 21:15:00	2010-Oct-21 07:55:00	15.1	0.343	0.086	125	0.01303	0.00809
2010-Oct-23	16	2.7	30.1	11.5	2010-Oct-24 13:20:00	2010-Oct-24 20:10:00	18.4	0.494	0.134	291	0.02119	0.01810
2010-Oct-26	8	5.0	24.4	6.3	2010-Oct-26 20:55:00	2010-Oct-27 07:35:00	15.2	0.302	0.074	58	0.00862	0.00537

2010-Nov-04	8	1.1	23.3	7.7	2010-Nov-05 06:50:00	2010-Nov-05 10:00:00	13.9	0.368	0.090	115	0.01601	0.02838
2010-Nov-16	25	4.2	26.3	9.1	2010-Nov-17 19:50:00	2010-Nov-17 09:00:00	15.7	0.412	0.106	203	0.00952	0.00909
2010-Nov-22	7	2.7	26.7	9.3	2010-Nov-22 21:45:00	2010-Nov-23 09:00:00	15.0	0.422	0.108	107	0.01748	0.01464
2010-Nov-25	9	4.2	26.5	5.1	2010-Nov-26 15:20:00	2010-Nov-26 08:35:00	13.3	0.230	0.060	77	0.00983	0.00513
2010-Nov-30	26	3.4	32.8	14.0	2010-Dec-01 19:05:00	2010-Dec-01 09:05:00	14.8	0.604	0.164	429	0.01893	0.01717

Note: Average Dry Weather Flow (DWF) pattern is based on the data of the displayed time range.

APPENDIX B.1

Pre-Development & Post-Development Sanitary Flow Calculations

Minimum Dia. =	**250**	**mm**							**SANITARY SEWER DESIGN SHEET**																
Mannings "n"=	**0.013**								**Marianeville Development Ltd.**																
Minimum Velocity =	**0.75**	**m/s**							**Town of Newmarket**																
Minimum Grade =	**0.5**	**%**							**Appendix B.2**																
Avg. Domestic Flow =	**360**	**l/c/d**																							
Infiltration =	**0.3**	**l/s/ha**																							
Max. Peaking Factor=	**4.0**																								
Min. Peaking Factor=	**1.5**			XX Street	Highlighted information represents proposed development																				
Maximum Velocity =	**3**	**m/s**		*XX Street*	Italicized information represents existing development																				

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Project: Glenway Country Club Re-development
Project No: L09-301
Date: November 22, 2013
Designed by: NT / DW

STREET	FROM MH	TO MH	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL					INFILTRATION	FLOW CALCULATIONS					PIPE DATA			
			AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (P/ha)	DENSITY (P/unit)	POP	ACC. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	ACC. EQUIV. POP.	(l/s)	TOTAL ACC. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	TOTAL FLOW (l/s)	DIA. (mm)	SLOPE (%)	Q FULL (l/s)	V FULL (m/s)
Eagle Street (singles)	*NORTH 1*	*28A*	*14.53*	*14.530*	*153*		*3.38*	*517*	*517*	*0.0*	*0*	*0*	*-*	*0*	*4.4*	*517*	*3.97*	*8.5*	*0.0*	*12.9*	*200*	*0.00*	*0.0*	*UNDER*
Eagle Street (towns)	*NORTH 2*	*28A*	*2.97*	*2.970*	*107*		*2.88*	*308*	*308*	*0.0*	*0*	*0*	*-*	*0*	*0.9*	*308*	*4.00*	*5.1*	*0.0*	*6.0*	*200*	*0.00*	*0.0*	*UNDER*
Eagle Street (Restaurant)	*NORTH 3*	*28A*	*1.00*	*1.000*	*0*			*0*	*0*	*0.6*	*0.615*	*0*	*6.94*	*0*	*0.5*	*0*	*4.00*	*0.0*	*4.3*	*4.8*	*200*	*0.00*	*0.0*	*UNDER*
Eagle Street (Retail / Office)	*NORTH 4*	*28A*	*5.82*	*5.820*	*0*			*0*	*0*	*1.3*	*1.275*	*0*	*0.46*	*0*	*2.1*	*0*	*4.00*	*0.0*	*0.6*	*2.7*	*200*	*0.00*	*0.0*	*UNDER*
Eagle Street	*28A*	*35A*	*0.28*	*24.600*	*0*			*0*	*825*	*0.0*	*1.89*	*0*	*-*	*0*	*7.9*	*825*	*3.85*	*13.2*	*4.9*	*26.1*	*250*	*2.15*	*87.2*	*1.78*
Eagle Street	*35A*	*36A*	*3.46*	*28.060*	*40*		*3.38*	*135*	*960*	*0.0*	*1.89*	*0*	*-*	*0*	*9.0*	*960*	*3.81*	*15.3*	*4.9*	*29.1*	*300*	*2.24*	*144.7*	*2.05*
Eagle Street	*36A*	*48A*	*3.63*	*31.690*	*42*		*3.38*	*142*	*1102*	*0.0*	*1.89*	*0*	*-*	*0*	*10.1*	*1102*	*3.77*	*17.3*	*4.9*	*32.3*	*375*	*0.35*	*103.7*	*0.94*
Eagle Street	A5.1	48A	3.13	3.130	40		3.38	135	135	0.0	0	0	-	0	0.9	135	4.00	2.3	0.0	3.2	200	0.00	0.0	UNDER
Eagle Street	*48A*	*60A*	*0.25*	*35.073*	*0*			*0*	*1238*	*0.0*	*1.89*	*0*	*-*	*0*	*11.1*	*1238*	*3.74*	*19.3*	*4.9*	*35.2*	*375*	*1.14*	*187.1*	*1.69*
Alex Doner Drive	*West*	*210A*	*16.15*	*16.150*	*173*		*3.38*	*585*	*585*	*0.0*	*0*	*0*	*-*	*0*	*4.8*	*585*	*3.94*	*9.6*	*0.0*	*14.4*	*200*	*0.00*	*0.0*	*UNDER*
Alex Doner Drive	A1.1	210A	0.46	0.460	6		3.38	20	20	0.0	0	0	-	0	0.1	20	4.00	0.3	0.0	0.5	200	0.00	0.0	UNDER
Alex Doner Drive	*210A*	*201A*	*1.97*	*18.580*	*14*		*3.38*	*47*	*652*	*0.0*	*0*	*0*	*-*	*0*	*5.6*	*652*	*3.91*	*10.6*	*0.0*	*16.2*	*250*	*0.88*	*55.8*	*1.14*
Alex Doner Drive	*201A*	*155A*	*0.04*	*18.620*	*0*			*0*	*652*	*0.0*	*0*	*0*	*-*	*0*	*5.6*	*652*	*3.91*	*10.6*	*0.0*	*16.2*	*300*	*0.74*	*83.1*	*1.18*
Alex Doner Drive	A2.1	155A	0.65	0.650	0			0	0	0.7	0.65	0	0.46	0	0.4	0	4.00	0.0	0.3	0.7	200	0.00	0.0	UNDER
Alex Doner Drive	*155A*	*88A*	*0.00*	*19.270*	*0*			*0*	*652*	*0.0*	*0.65*	*0*	*-*	*0*	*6.0*	*652*	*3.91*	*10.6*	*0.3*	*16.9*	*300*	*0.51*	*69.0*	*0.98*
Crossland Gate	A3.1	88A	1.81	1.810	21		3.38	71	71	0.0	0	0	-	0	0.5	71	4.00	1.2	0.0	1.7	200	0.00	0.0	UNDER
Crossland Gate	A3.2	88A	3.75	3.750	138		2.88	397	397	0.0	0	0	-	0	1.1	397	4.00	6.6	0.0	7.7	200	0.00	0.0	UNDER
Crossland Gate	A3.3	88A	1.85	1.850	67		2.88	193	193	0.0	0	0	-	0	0.6	193	4.00	3.2	0.0	3.8	200	0.00	0.0	UNDER
Crossland Gate(Apartments)	*88A*	*77A*	*1.24*	*27.920*	*101*		*1.95*	*197*	*1511*	*0.0*	*0.65*	*0*	*-*	*0*	*8.6*	*1511*	*3.68*	*23.1*	*0.3*	*32.0*	*300*	*0.40*	*61.1*	*0.86*
Crossland Gate(Singles)	*88A*	*77A*	*2.48*	*2.480*	*24*		*3.38*	*81*	*81*	*0.0*	*0*	*0*	*-*	*0*	*0.7*	*81*	*4.00*	*1.4*	*0.0*	*2.1*	*300*	*0.00*	*0.0*	*UNDER*
Crossland Gate	*77A*	*69A*	*6.83*	*37.230*	*66*		*3.38*	*223*	*1815*	*0.0*	*0.65*	*0*	*-*	*0*	*11.4*	*1815*	*3.62*	*27.4*	*0.3*	*39.0*	*375*	*0.42*	*113.6*	*1.03*
Alex Doner Drive	*WEST*	*71A*	*14.05*	*14.050*	*161*		*3.38*	*544*	*544*	*0.0*	*0*	*0*	*-*	*0*	*4.2*	*544*	*3.96*	*9.0*	*0.0*	*13.2*	*200*	*0.00*	*0.0*	*UNDER*
Alex Doner Drive	A6.1	71A	4.53	4.530	41		3.38	139	139	0.0	0	0	-	0	1.4	139	4.00	2.3	0.0	3.7	200	0.00	0.0	UNDER
Alex Doner Drive	A6.2	71A	2.38	2.380	24		3.38	81	81	0.0	0	0	-	0	0.7	81	4.00	1.4	0.0	2.1	200	0.00	0.0	UNDER
Alex Doner Drive	*71A*	*69A*	*0.10*	*21.060*	*0*			*0*	*764*	*0.0*	*0*	*0*	*-*	*0*	*6.3*	*764*	*3.87*	*12.3*	*0.0*	*18.6*	*250*	*2.40*	*92.1*	*1.88*
Crossland Gate	A4.1	69A	1.16	1.160	11		3.38	37	37	0.0	0	0	-	0	0.3	37	4.00	0.6	0.0	1.0	200	0.00	0.0	UNDER
Crossland Gate	A4.2	69A	4.63	4.630	45		3.38	152	152	0.0	0	0	-	0	1.4	152	4.00	2.5	0.0	3.9	200	0.00	0.0	UNDER

Minimum Dia. =	**250**	**mm**							**SANITARY SEWER DESIGN SHEET**																	
Mannings "n"=	**0.013**								**Marianeville Development Ltd.**																	
Minimum Velocity =	**0.75**	**m/s**							**Town of Newmarket**																	
Minimum Grade =	**0.5**	**%**							**Appendix B.2**																	
Avg. Domestic Flow =	**360**	**l/c/d**																			**Project:**	**Glenway Country Club Re-development**				
Infiltration =	**0.3**	**l/s/ha**																			**Project No:**	**L09-301**				
Max. Peaking Factor=	**4.0**																				**Date:**	**November 22, 2013**				
Min. Peaking Factor=	**1.5**			XX Street	Highlighted information represents proposed development																**Designed by:**	**NT / DW**				
Maximum Velocity =	**3**	**m/s**		*XX Street*	Italicized information represents existing development																					

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STREET	FROM MH	TO MH	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL					INFILTRATION	FLOW CALCULATIONS					PIPE DATA			
			AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (P/ha)	DENSITY (P/unit)	POP	ACC. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	ACC. EQUIV. POP.	(l/s)	TOTAL ACC. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	TOTAL FLOW (l/s)	DIA. (mm)	SLOPE (%)	Q FULL (l/s)	V FULL (m/s)
Crossland Gate	A4.3	69A	1.29	1.290	16		3.38	54	54	0.0	0	0	-	0	0.4	54	4.00	0.9	0.0	1.3	200	0.00	0.0	UNDER
Crossland Gate	A4.4	69A	2.27	2.270	292		1.95	569	569	0.0	0	0	-	0	0.7	569	3.94	9.4	0.0	10.0	200	0.00	0.0	UNDER
Crossland Gate	A4.5	69A	0.45	0.450	14		2.88	40	40	0.0	0	0	-	0	0.1	40	4.00	0.7	0.0	0.8	200	0.00	0.0	UNDER
Crossland Gate	*69A*	*60A*	*5.47*	*73.560*	*58*		*3.38*	*196*	*3628*	*0.0*	*0.65*	*0*	*-*	*0*	*22.3*	*3628*	*3.37*	*51.0*	*0.3*	*73.5*	*375*	*0.32*	*99.1*	*0.90*
Peevers Crescent	*60A*	*93A*	*1.57*	*110.203*	*20*		*3.38*	*68*	*4933*	*0.0*	*2.54*	*0*	*-*	*0*	*33.8*	*4933*	*3.25*	*66.8*	*5.2*	*105.8*	*450*	*0.35*	*168.6*	*1.06*
Peevers Crescent	*NORTH*	*93A*	*2.51*	*2.510*	*32*		*3.38*	*108*	*108*	*0.0*	*0*	*0*	*-*	*0*	*0.8*	*108*	*4.00*	*1.8*	*0.0*	*2.6*	*200*	*0.00*	*0.0*	*UNDER*
Peevers Crescent	*93A*	*120A*	*0.41*	*113.123*	*5*		*3.38*	*17*	*5058*	*0.0*	*2.54*	*0*	*-*	*0*	*34.7*	*5058*	*3.24*	*68.3*	*5.2*	*108.2*	*450*	*0.34*	*166.2*	*1.04*
Peevers Crescent	*NORTH*	*120A*	*1.01*	*1.010*	*14*		*3.38*	*47*	*47*	*2.7*	*2.73*	*0*	*0.46*	*0*	*1.1*	*47*	*4.00*	*0.8*	*1.3*	*3.2*	*200*	*0.00*	*0.0*	*UNDER*
Easement	*120A*	*112A*	*0.00*	*114.133*	*0*			*0*	*5106*	*0.0*	*5.27*	*0*	*-*	*0*	*35.8*	*5106*	*3.24*	*68.9*	*6.4*	*111.1*	*450*	*0.50*	*201.5*	*1.27*

Computed By: E.P.
Date: JULY 13/1992
Revision: JAN. 3/1995

TOWN OF NEWMARKET

SANITARY SEWER DESIGN
"AS CONSTRUCTED"

G.M. SERNAS & ASSOCIATES
141 BRUNEL ROAD
MISSISSAUGA, ONT L4Z 1X3
TEL: (416) 890-8483

Location: GLENWAY ESTATES AND COUNTRY CLUB
JOB NO. 8202.530

NOTE: CURRENT REVISIONS BY URBAN ECOSYSTEMS LIMITED(93002SN1)

	cms/ha.		cms/ha.
Single Family (15m)	0.0013	Apartment - 148 uph	0.0035
Single Family (9.75m)	0.0016	Apartment - 149 to 247 uph	0.0060
Commercial/Industrial	0.0017	Apartment - 248 to 296 uph	0.0070
School/Multi Family	0.0025		

LOCATION STREET NAME	From MH	To MH	AREA (HECTARES) Single Family (9.75m)	Single Family (15m)	Comm. Ind.	School Multi. Family	Apts. <148 u.p.h.	Apts. 149 to 247 u.p.h.	Apts. 248 to 296 u.p.h.	Cumul. Area (hec.)	DESIGN FLOWS Leg (cms)	Cumul. (cms)	PROPOSED SEWER Mann. n	Dia mm	Slope %	Capac. (cms)	Leng. m	VELOCITY Full (m/s)	Act. (m/s)	Actual Diam.
EAGLE ST. W.	1A	3A			2.98					2.98	0.0038									
	1A	3A			4.71					4.71	0.0310	0.0348	0.013	250	0.72	0.053		1.04	0.49	254.00
BOWSER CRES.	9A	3A		3.49						11.18	0.0045	0.0045	0.013	250	2.52	0.098		1.94	0.91	254.00
BOWSER CRES.	12A	5A		5.62						16.80	0.0073	0.0073	0.013	250	1.14	0.066		1.31	0.61	254.00
EVES COURT	PLUG	21A			1.57					1.57	0.0009	0.0009	0.013	250	0.50	0.044		0.87	0.28	254.00
MILLARD AVE.W.		32A			3.08					3.08	0.0122									
	21A	28A		5.64						10.29	0.0073	0.0204	0.013	250	0.58	0.047		0.93	0.44	254.00
EAGLE ST. W.	5A	35A		0.52						27.61	0.0007	0.0678	0.013	250	2.02	0.088		1.74	0.82	254.00
GLENWAY CIRCLE	40A	35A		3.17						3.17	0.0041	0.0041	0.013	250	0.39	0.039		0.76	0.36	254.00
EAGLE ST. W.	35A	36A		0.73						31.51	0.0009	0.0728	0.013	250	2.24	0.093		1.83	0.86	254.00

Computed By: E.P.
Date: JULY 13/1992
Revision: JAN. 3/1995

TOWN OF NEWMARKET

SANITARY SEWER DESIGN
"AS CONSTRUCTED"

G.M. SERNAS & ASSOCIATES
141 BRUNEL ROAD
MISSISSAUGA, ONT L4Z 1X3
TEL: (416) 890-8483

Location: GLENWAY ESTATES AND COUNTRY CLUB
JOB NO. 8202.530

NOTE: CURRENT REVISIONS BY URBAN ECOSYSTEMS LIMITED(93002SN1)

	cms/ha.		cms/ha.
Single Family (15m)	0.0013	Apartment - 148 uph	0.0035
Single Family (9.75m)	0.0016	Apartment - 149 to 247 uph	0.0060
Commercial/Industrial	0.0017	Apartment - 248 to 296 uph	0.0070
School/Multi Family	0.0025		

LOCATION STREET NAME	From MH	To MH	AREA (HECTARES) Single Family (9.75m)	Single Family (15m)	Comm. Ind.	School Multi. Family	Apts. <148 u.p.h.	Apts. 149 to 247 u.p.h.	Apts. 248 to 296 u.p.h.	Cumul. Area (hec.)	DESIGN FLOWS Leg (cms)	Cumul. (cms)	PROPOSED SEWER Mann. n	Dia mm	Slope %	Capac. (cms)	Leng. m	VELOCITY Full (m/s)	Act. (m/s)	Actual Diam.
GLENWAY CIRCLE	47A	36A		3.54						3.54	0.0046	0.0046	0.013	250	0.53	0.045		0.89	0.42	254.00
EAGLE ST. W.	36A	60A								35.05	0.0000	0.0774	0.013	375	0.35	0.108		0.95	0.45	381.00
DONER DRIVE	239A	223A		3.58						3.58	0.0047	0.0047	0.013	250	1.16	0.067		1.32	0.62	254.00
OTTON RD.	232A	223A		5.03						8.61	0.0065	0.0065	0.013	250	0.44	0.041		0.81	0.38	254.00
MATHEWS COURT	276A	217A		2.79						11.40	0.0036	0.0036	0.013	250	0.35	0.037		0.72	0.34	254.00
DONER DRIVE	223A	155A		6.53						17.93	0.0085	0.0233	0.013	250	0.44	0.041		0.81	0.38	254.00
DONER DRIVE	155A	88A			4.61					4.61	0.0080	0.0313	0.013	300	0.29	0.054		0.74	0.35	304.80
CROSSLAND GATE	88A	77A		2.86						25.40	0.0037	0.0350	0.013	300	0.40	0.064		0.87	0.41	304.80
FAIRWAY GARDEN	84A	77A		3.35						3.35	0.0044	0.0044	0.013	250	0.51	0.044		0.87	0.41	254.00
CROSSLAND GATE	77A	69A		3.09						31.84	0.0040	0.0434	0.013	375	0.42	0.119		1.04	0.49	381.00

Computed By: E.P.
Date: JULY 13/1992
Revision: JAN. 3/1995

TOWN OF NEWMARKET

SANITARY SEWER DESIGN
"AS CONSTRUCTED"

G.M. SERNAS & ASSOCIATES
141 BRUNEL ROAD
MISSISSAUGA, ONT L4Z 1X3
TEL: (416) 890-8483

Location: GLENWAY ESTATES AND COUNTRY CLUB
JOB NO. 8202.530

NOTE: CURRENT REVISIONS BY URBAN ECOSYSTEMS LIMITED(93002SN1)

	cms/ha.		cms/ha.
Single Family (15m)	0.0013	Apartment - 148 uph	0.0035
Single Family (9.75m)	0.0016	Apartment - 149 to 247 uph	0.0060
Commercial/Industrial	0.0017	Apartment - 248 to 296 uph	0.0070
School/Multi Family	0.0025		

LOCATION STREET NAME	From MH	To MH	AREA (HECTARES) Single Family (9.75m)	Single Family (15m)	Comm. Ind.	School Multi. Family	Apts. <148 u.p.h.	Apts. 149 to 247 u.p.h.	Apts. 248 to 296 u.p.h.	Cumul. Area (hec.)	DESIGN FLOWS Leg (cms)	Cumul. (cms)	PROPOSED SEWER Mann. n	Dia mm	Slope %	Capac. (cms)	Leng. m	VELOCITY Full (m/s)	Act. (m/s)	Actual Diam.
DONER DRIVE	240A	248A		4.65						4.65	0.0060	0.0060	0.013	250	0.68	0.051		1.01	0.47	254.00
KIRBY CRES.	257A	248A		2.92						2.92	0.0038	0.0038	0.013	250	0.46	0.042		0.83	0.39	254.00
DONER DRIVE	248A	274A		0.89						8.46	0.0012	0.0110	0.013	250	3.81	0.121		2.39	1.12	254.00
KIRBY CRES.	263A	274A		4.05						4.05	0.0053	0.0053	0.013	250	0.97	0.061		1.21	0.57	254.00
DONER DRIVE	274A	266A		2.71						15.22	0.0035	0.0198	0.013	250	2.00	0.088		1.73	0.81	254.00
CROSSLAND GATE	69A	60A		5.71						52.77	0.0074	0.0706	0.013	375	0.32	0.103		0.91	0.43	381.00
PEEVERS CRES.	60A	93A		1.68						89.50	0.0022	0.1502	0.013	450	0.35	0.176		1.07	0.50	457.20
BRAMMAR ST.	98A	93A		2.22						2.22	0.0029	0.0029	0.013	250	0.59	0.048		0.94	0.44	254.00
PEEVERS CRES.	93A	120A		0.50						92.22	0.0007	0.1538	0.013	450	0.34	0.173		1.06	0.50	457.20
PEEVERS CRES.	BLK.4	123A			3.67					3.67	0.0218	0.0218	0.013	250	0.50	0.044		0.87	0.41	254.00
PEEVERS CRES.	132A	120A		1.20						4.87	0.0016	0.0234	0.013	250	0.47	0.043		0.84	0.39	254.00

Computed By: E.P.
Date: JULY 13/1992
Revision: JAN. 3/1995

TOWN OF NEWMARKET

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Location: GLENWAY ESTATES AND COUNTRY CLUB
JOB NO. 8202.530

NOTE: CURRENT REVISIONS BY URBAN ECOSYSTEMS LIMITED(93002SN1)

	cms/ha.		cms/ha.
Single Family (15m)	0.0013	Apartment - 148 uph	0.0035
Single Family (9.75m)	0.0016	Apartment - 149 to 247 uph	0.0060
Commercial/Industrial	0.0017	Apartment - 248 to 296 uph	0.0070
School/Multi Family	0.0025		

LOCATION STREET NAME	From MH	To MH	AREA (HECTARES) Single Family (9.75m)	Single Family (15m)	Comm. Ind.	School Multi. Family	Apts. <148 u.p.h.	Apts. 149 to 247 u.p.h.	Apts. 248 to 296 u.p.h.	Cumul. Area (hec.)	DESIGN FLOWS Leg (cms)	Cumul. (cms)	PROPOSED SEWER Mann. n	Dia mm	Slope %	Capac. (cms)	Leng. m	VELOCITY Full (m/s)	Act. (m/s)	Actual Diam.
EASEMENT	120A	104A								97.09	0.0000	0.1771	0.013	450	0.52	0.214		1.31	0.61	457.20
EASEMENT	104A	112A			4.85					101.94	0.0192	0.1963	0.013	450	0.48	0.206		1.26	0.59	457.20
EASEMENT	EX.MH	112A		11.33	16.19	8.90				36.42	0.0863									25.40
	EX.MH	112A		16.05	4.80					20.85	0.0329									25.40
	EX.MH	112A					2.50			59.77	0.0135	0.1327	0.013	375	1.70	0.238		2.09	0.98	381.00
EASEMENT	112A	TRUNK		6.00						6.00	0.0078									25.40
	112A	TRUNK			4.86					10.86	SEE NOTE		0.013	450	1.30	0.339		2.07		457.2

NOTE: FOR FLOWS EAST OF MN 112A TO TRUNK SEE G.M. SERNAS &ASSOC. LTD. WESTERN SUB-TRUNK REPORT (1985)

APPENDIX B.2
100-Year Storm Sewer Design Sheet
(Central Drainage Shed-A)

EL. FROM CENTRELINE TO BASEMENT (m)= 1.76
ALLOWABLE DISTANCE FROM BASEMENT TO HGL (m)= 0.50
STARTING DOWNSTREAM HGL (if above obvert) (m) = 267.85

ICD Types	CB on Grade Flow (m^3/s)	CB in Sag Flow (m^3/s)	DCB in Sag Flow (m^3/s)
Type "A"	0.0198	0.022	-
Type "B"	0.0283	0.0305	-
Type "C"	0.0368	0.04	-
No ICD	0.06	0.1	0.17

Connection for STREET B and CONDO BLOCK 158

Marianneville Developments Ltd.
(Tributary to Pond # 6)
Town of Newmarket

Intensity Formula:

$I_{5yr} = \frac{648}{(Tc + 4)^{0.798}}$

$I_{100yr} = \frac{1770}{(Tc + 4)^{0.82}}$

100 YEAR & HYDRAULIC GRADE LINE ANALYSIS

Project: Marianeville Developments Ltd.
Project No: L09-301
Date: Nov. 20, 2013
Designed by: B.A.

S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development - Newmarket\Calcs\Pipe Design\Storm Design\L09-301-POND-6N-100year__HGL.xls]HGL PRESENTATION

STREET	MH		100-YR AREA (m^2)	ACC. 100 YR AREA (m^2)	100-YR runoff coefficient "R"	ACC. 5-YR FLOW (m^3/s)	100-YR rainfall intensity (mm/hr)	ACC. 100 YR FLOW (m^3/s)	ACC. Time of Concentration (min)	ICD's										ACC. CB FLOW (m^3/s)	PIPE DATA								SURCHARGED PIPE U/S HGL				HGL VS BASEMENT					
										No. CBs ON GRADE				No. CBs IN SAG				No. DCBs IN SAG	No. SCB IN SAG	CAPTURED FLOW BY CB		1	2	3				4		5	19	20	21	22					
	FROM	TO								No ICD	ICD Type "A"	ICD Type "B"	ICD Type "C"	No ICD	ICD Type "A"	ICD Type "B"	ICD Type "C"	No ICD	No ICD	(m^3/s)		Pipe Slope (%)	HGL Downstream (m)	Pipe Diameter Do (mm)	MH Diameter (mm)	Pipe Area (m^2)	HYD RAD	Q100YR Min (Q 100year, Acc. CB Q)	Qcap (m^3/s)	Lo Length of Pipe (m)	EGLo 2+7	EGLi 10+18+19	U/S HGL EGL-7	U/S Ovb	HGL Max (21, 21a, 22)	Pipe Check	Service Conn. (Y/N)	MH Top U/S (m)	FFF (U/S)	Basement Floor (m)
STREET B	MH18	MH19	0.31	0.31	0.80	0.04	203.31	0.14	10.56	0	0	0	0	0	0	0	0	0	0	0.000	0.00	1.40	274.12	300.00	1,200	0.07	0.08	0.04	0.11	54.00	274.13	274.23	274.21	275.01	275.01	OK	Y	277.85	278.63	276.09
STREET B	MH14	SCB	0.00	0.00	0.80	0.00	203.31	0.00	10.36	0	0	0	0	0	0	0	0	0	0	0.000	0.00	2.00	278.36	375.00	1,200	0.11	0.09	0.00	0.25	48.00	278.36	278.36	278.36	279.70	279.70	OK	N	280.96	281.74	279.20
STREET B	SCB	MH19	0.40	0.40	0.80	0.05	199.16	0.18	10.60	0	0	0	0	0	0	0	1	0	0	0.492	0.49	2.00	274.12	600.00	1,200	0.28	0.15	0.18	0.87	45.00	274.14	274.18	274.16	274.50	274.50	OK	N	278.70	279.48	276.94
STREET B	MH19	MH20	0.23	1.08	0.80	0.13	196.22	0.47	10.94	2	0	0	0	0	0	0	0	0	0	0.120	0.67	2.40	272.66	600.00	1,200	0.28	0.15	0.47	0.95	65.30	272.79	273.18	273.04	274.12	274.12	OK	Y	274.65	277.86	275.32
BLOCK 159	EXT	MH26	0.33	0.33	0.78	0.04	203.31	0.14	10.01	0	0	0	0	0	0	0	0	0	0	0.000	0.00	1.00	275.12	300.00	1,200	0.07	0.08	0.04	0.10	1.00	275.14	275.14	275.12	275.16	275.16	OK	Y	277.08	278.78	276.24
BLOCK 159	MH26	MH25	0.45	0.78	0.78	0.09	203.16	0.34	10.43	0	0	0	0	0	0	0	0	0	0	0.000	0.00	2.00	274.07	300.00	1,200	0.07	0.08	0.09	0.14	48.00	274.16	274.61	274.52	275.12	275.12	OK	Y	278.00	278.63	276.09
BLOCK 159	MH25	MH20	0.18	0.96	0.80	0.11	198.37	0.41	10.85	2	0	0	0	0	0	0	0	0	0	0.120	0.12	2.00	272.66	300.00	1,200	0.07	0.08	0.12	0.14	49.00	272.80	273.57	273.42	273.28	273.42	Surcharged	Y	277.85	277.64	275.10
STREET B	MH20	MH21	0.15	2.32	0.80	0.28	192.73	0.98	11.20	0	0	0	0	0	0	0	0	0	0	0.000	0.85	1.20	272.12	675.00	1,500	0.36	0.17	0.85	0.92	40.00	272.41	272.84	272.55	272.66	272.66	OK	Y	276.86	276.33	273.79
STREET C	MH21	MH22	0.19	2.51	0.80	0.30	190.03	1.05	11.32	0	0	0	0	0	0	0	0	0	0	0.000	0.85	2.00	271.77	675.00	1,500	0.36	0.17	0.85	1.19	24.50	272.05	272.33	272.04	272.12	272.12	OK	Y	274.00	275.68	273.14
BLOCK 158	SCB1	MH22	0.30	0.30	0.80	0.04	203.31	0.13	10.05	0	0	0	0	0	0	0	0	0	1	0.680	0.68	1.00	271.77	450.00	1,500	0.16	0.11	0.13	0.28	5.00	271.80	271.81	271.78	271.75	271.78	Surcharged	N	275.55	275.30	272.76
BLOCK 158	MH22	MH23	1.10	4.10	0.80	0.49	188.78	1.70	11.57	2	0	0	0	0	0	0	0	0	0	0.120	1.71	3.50	270.10	750.00	1,500	0.44	0.19	1.70	2.08	70.80	270.85	272.52	271.77	271.58	271.77	Surcharged	Y	274.90	275.33	272.79
BLOCK 158	MH23	MH24	1.28	5.87	0.80	0.69	186.29	2.41	11.86	2	0	0	0	0	0	0	0	0	0	0.120	1.95	3.50	268.36	900.00	1,500	0.64	0.23	1.95	3.39	90.00	268.84	270.58	270.10	269.25	270.10	Surcharged	N	272.00	273.03	270.49
BLOCK 158	MH24	HW	0.00	6.05	0.50	0.70	183.57	2.44	11.95	0	0	0	0	0	0	0	0	0	0	0.000	2.01	4.00	267.85	900.00	1,500	0.64	0.23	2.01	3.62	32.00	268.36	268.87	268.36	267.28	268.36	Surcharged	N	274.52	271.13	268.59
BLOCK 158	RLCB3	MH23	0.18	0.18	0.80	0.02	203.31	0.08	10.48	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	270.10	250.00	750	0.05	0.06	0.06	0.06	35.00	270.17	270.53	270.46	269.95	270.46	Surcharged	N	271.00	271.78	269.24
BLOCK 158	RLCB2	MH23	0.31	0.31	0.80	0.04	203.31	0.14	10.48	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	270.10	250.00	750	0.05	0.06	0.06	0.06	35.00	270.17	270.53	270.46	268.55	270.46	Surcharged	N	270.10	270.88	268.34
BLOCK 158	MH22	MH23	1.10	4.10	0.80	0.49	188.78	1.70	11.57	2	0	0	0	0	0	0	0	0	0	0.120	1.71	3.50	270.10	750.00	1,500	0.44	0.19	1.70	2.08	70.80	270.85	272.52	271.77	271.58	271.77	Surcharged	Y	274.55	275.33	272.79
BLOCK 158	RLCB1	MH24	0.18	0.18	0.80	0.02	203.31	0.08	10.48	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	268.36	250.00	750	0.05	0.06	0.06	0.06	35.00	268.44	268.80	268.72	266.80	268.72	Surcharged	N	272.25	270.63	268.09
BLOCK 158	MH24	HW	0.00	6.05	0.50	0.70	183.57	2.44	11.95	0	0	0	0	0	0	0	0	0	0	0.000	2.01	4.00	267.85	900.00	1,500	0.64	0.23	2.01	3.62	32.00	268.36	268.87	268.36	267.28	268.36	Surcharged	N	269.85	271.13	268.59

APPENDIX B.3
5-Year And 100-Year Storm Sewer Design Sheets
(Central Drainage Shed-B)

Connection for: STREET A and CONDO BLOCK 157
5 yr Storm Sewer Design Sheet
Marianneville Developments Ltd.
(Tributary to Pond #6)
Town of Newmarket

(Existing condition with proposed development)

Rainfall Intensity = $\frac{A}{(Tc+B)^{c}}$

	5-YEAR	100-YEAR
A=	648	1770
B=	4	4
c=	0.798	0.82

Starting Tc = 10 min

Project: Estates of Glenway
Project No: L09-301
Date: Nov. 20, 2013
Designed by: BA

File Location: S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development - Newmarket\Calcs\Pipe Design\Storm Design\[L09-301 5yr-STM.xls]5yr-EX + PROPOSED

STREET	FROM MH	TO MH	5-YR AREA (ha)	5-YR RUNOFF COEFFICIENT "R"	5-YR "AR"	5-YR ACCUM. "AR"	5-YR RAINFALL INTENSITY (mm/hr)	5-YR ACCUM. FLOW (m^3/s)	Total Flow (m^3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONC. (min)	ACTUAL VELOCITY (m/s)
Kirby Crescent	Tower	257	0.14	0.25	0.04	0.04	78.88	0.008	0.008	23.00	4.49	300	0.205	2.899	0.132	10.132	0.533
Kirby Crescent	257	256	0.77	0.59	0.45	0.49	78.29	0.106	0.106	60.50	2.50	300	0.153	2.163	0.466	10.598	1.118
Kirby Crescent	256	255	0.7	0.59	0.41	0.90	76.29	0.191	0.191	85.70	4.84	375	0.386	3.492	0.409	11.007	1.805
Kirby Crescent	255	254	0.6	0.59	0.35	1.26	74.62	0.260	0.260	84.40	3.86	375	0.344	3.119	0.451	11.458	1.860
Kirby Crescent	254	253	0.19	0.59	0.11	1.37	72.88	0.277	0.277	25.20	2.66	450	0.465	2.924	0.144	11.602	1.798
Kirby Crescent	253	248	0.23	0.59	0.14	1.50	72.35	0.302	0.302	48.60	3.16	450	0.507	3.187	0.254	11.856	1.960
Kirby Crescent	CB-1	262	0.11	0.59	0.06	0.06	78.88	0.014	0.014	8.50	1.00	250	0.059	1.211	0.117	10.117	0.387
Kirby Crescent	CB-2	262	0.33	0.59	0.19	0.19	78.88	0.043	0.043	10.00	1.00	300	0.097	1.368	0.122	10.122	0.616
Kirby Crescent	262	260	0.06	0.59	0.04	0.30	78.34	0.064	0.064	14.00	4.97	300	0.215	3.050	0.077	10.198	1.223
Kirby Crescent	260	259	0.59	0.59	0.35	0.64	78.00	0.139	0.139	60.50	4.59	300	0.207	2.931	0.344	10.542	1.452
Kirby Crescent	259	258	0.6	0.59	0.35	1.00	76.52	0.212	0.212	58.40	5.00	375	0.392	3.550	0.274	10.817	1.908
Kirby Crescent	258	252	0.88	0.59	0.52	1.52	75.39	0.318	0.318	89.00	4.71	375	0.380	3.445	0.431	11.247	2.119
Kirby Crescent	252	251	0.48	0.59	0.28	1.80	73.69	0.368	0.368	60.10	1.73	525	0.565	2.613	0.383	11.630	1.831
Kirby Crescent	251	250	0.32	0.59	0.19	1.99	72.24	0.399	0.399	40.20	0.92	600	0.589	2.083	0.322	11.952	1.587
Kirby Crescent	250	274	0.31	0.59	0.18	2.17	71.08	0.429	0.429	57.00	1.53	600	0.759	2.686	0.354	12.306	1.966
Alex Doner Drive	Pond-3	245	0	0.59	0.00	0.00	78.88	0.000	0.240	80.00	1.15	450	0.306	1.922	0.694	10.694	1.284
Alex Doner Drive	245	246	0.17	0.59	0.10	0.10	75.89	0.021	0.261	36.00	0.93	525	0.415	1.916	0.313	11.007	1.311
Alex Doner Drive	246	247	0.37	0.59	0.22	0.32	74.63	0.066	0.306	60.80	1.33	525	0.496	2.291	0.442	11.449	1.568
Alex Doner Drive	247	270	0.56	0.59	0.33	0.65	72.92	0.131	0.371	70.00	1.59	525	0.542	2.505	0.466	11.915	1.795
Alex Doner Drive	CBMH	270	1.32	0.25	0.33	0.33	78.88	0.072	0.072	51.00	7.00	250	0.157	3.205	0.265	10.265	1.286
Alex Doner Drive	270	248	0.42	0.59	0.25	1.23	71.21	0.243	0.483	70.00	3.13	525	0.760	3.515	0.332	12.247	2.463
Alex Doner Drive	248	249	0.26	0.59	0.15	2.88	70.05	0.561	0.801	52.00	2.31	600	0.933	3.301	0.263	12.509	2.697
Alex Doner Drive	249	274	0.35	0.59	0.21	3.09	69.16	0.594	0.834	52.00	3.20	600	1.098	3.885	0.223	12.732	3.070
Alex Doner Drive	274	264	0.13	0.59	0.08	5.34	68.42	1.015	1.255	31.30	1.66	750	1.434	3.247	0.161	12.893	3.033
Alex Doner Drive	264	265	0.26	0.59	0.15	5.49	67.90	1.036	1.276	39.40	2.06	825	2.059	3.854	0.170	13.063	3.434
Alex Doner Drive	265	266	0.6	0.59	0.35	5.85	67.36	1.094	1.334	91.50	1.96	825	2.009	3.759	0.406	13.469	3.433
Easement	RLCB	CBMH1	0.8	0.59	0.47	0.47	78.88	0.103	0.103	50.00	0.69	375	0.146	1.319	0.632	10.632	0.761
Easement	CBMH1	CBMH2	0.14	0.25	0.04	0.51	76.15	0.107	0.107	19.00	0.75	375	0.152	1.375	0.230	10.862	0.794
Easement	CBMH2	267	0	0.25	0.00	0.51	75.21	0.106	0.106	39.00	0.69	375	0.146	1.319	0.493	11.355	0.787
Easement	267	266	0	0.25	0.00	0.51	73.27	0.103	0.103	15.50	1.30	375	0.200	1.810	0.143	11.498	0.973
Easement	266	154	0.05	0.59	0.03	6.38	66.11	1.172	1.412	34.50	2.94	825	2.460	4.604	0.125	13.594	4.049
Alex Doner Drive	RLCB10	MH12	0.17	0.59	0.10	0.10	78.88	0.022	0.022	45.00	1.00	250	0.059	1.211	0.619	10.619	0.455
Crossland Gate	RLCB9	MH12	0.16	0.59	0.09	0.09	78.88	0.021	0.021	57.00	1.00	250	0.059	1.211	0.784	10.784	0.455
Crossland Gate	MH12	MH11	0.59	0.42	0.25	0.44	75.52	0.093	0.093	64.00	1.40	300	0.114	1.619	0.659	11.443	0.870
Crossland Gate	MH11	MH10	0.4	0.40	0.16	0.60	72.94	0.122	0.122	64.00	1.80	450	0.382	2.405	0.444	11.887	1.243
Fairway Garden	MH10	MH9	0.24	0.50	0.12	0.72	71.31	0.143	0.143	34.00	2.00	450	0.403	2.535	0.224	12.110	1.363
Fairway Garden	RLCB8	MH9	0.19	0.59	0.11	0.11	78.88	0.025	0.025	55.00	1.00	250	0.059	1.211	0.757	10.757	0.455
Fairway Garden	MH9	MH8	0.1	0.59	0.06	0.89	70.52	0.175	0.175	24.50	2.40	450	0.441	2.777	0.147	12.257	1.549
Fairway Garden	RLCB7	MH8	0.23	0.59	0.14	0.14	78.88	0.030	0.030	56.00	1.00	250	0.059	1.211	0.770	10.770	0.486
Fairway Garden	RLCB6	MH8	0.24	0.59	0.14	0.14	78.88	0.031	0.031	54.00	1.00	250	0.059	1.211	0.743	10.743	0.516
Fairway Garden	MH8	MH7	0.78	0.50	0.39	1.56	70.01	0.304	0.304	62.00	2.00	450	0.403	2.535	0.408	12.665	1.693

Connection for: STREET A and CONDO BLOCK 157
5 yr Storm Sewer Design Sheet
Marianneville Developments Ltd.
(Tributary to Pond #6)
Town of Newmarket

(Existing condition with proposed development)

Rainfall Intensity = $\frac{A}{(Tc+B)^c}$

	5-YEAR	100-YEAR
A=	648	1770
B=	4	4
c=	0.798	0.82

Starting Tc = 10 min

Project: Estates of Glenway
Project No: L09-301
Date: Nov. 20, 2013
Designed by: BA

File Location: S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development - Newmarket\Calcs\Pipe Design\Storm Design\[L09-301 5yr-STM.xls]5yr-EX + PROPOSED

STREET	FROM MH	TO MH	5-YR AREA (ha)	5-YR RUNOFF COEFFICIENT "R"	5-YR "AR"	5-YR ACCUM. "AR"	5-YR RAINFALL INTENSITY (mm/hr)	5-YR ACCUM. FLOW (m^3/s)	Total Flow (m^3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONC. (min)	ACTUAL VELOCITY (m/s)
Crossland Gate	RLCB5	MH7	0.24	0.59	0.14	0.14	78.88	0.031	0.031	60.00	1.00	250	0.059	1.211	0.825	10.825	0.516
Crossland Gate	MH7	MH6	0.74	0.51	0.38	2.08	68.64	0.397	0.397	57.00	0.75	600	0.531	1.881	0.505	13.170	1.486
Crossland Gate	RLCB4	MH6	0.27	0.59	0.16	0.16	78.88	0.035	0.035	59.00	1.00	250	0.059	1.211	0.812	10.812	0.516
Crossland Gate	MH6	MH5	0.44	0.50	0.22	2.46	67.02	0.458	0.458	39.00	0.75	600	0.531	1.881	0.346	13.516	1.537
Crossland Gate	MH5	MH4	0.19	0.59	0.11	2.70	65.97	0.495	0.495	34.60	0.75	675	0.728	2.034	0.283	13.799	1.662
Crossland Gate	RLCB3	MH5	0.22	0.59	0.13	0.13	78.88	0.028	0.028	54.00	1.00	250	0.059	1.211	0.743	10.743	0.486
Easement	RLCB2	MH4	0.14	0.59	0.08	0.08	78.88	0.018	0.018	61.00	1.00	250	0.059	1.211	0.839	10.839	0.422
Alex Doner Drive	MH4	MH3	0.18	0.59	0.11	2.89	65.13	0.523	0.523	36.50	1.00	675	0.840	2.349	0.259	14.058	1.888
BLOCK 157	EXT	MH17	0.23	0.59	0.14	0.14	78.88	0.030	0.030	10.00	1.00	250	0.059	1.211	0.138	10.138	0.486
BLOCK 157	MH17	MH16	0.73	0.59	0.43	0.57	78.27	0.123	0.123	90.00	1.60	375	0.222	2.008	0.747	10.885	1.080
BLOCK 157	MH16	MH15	0.72	0.59	0.42	0.99	75.12	0.207	0.207	90.00	2.30	450	0.432	2.719	0.552	11.436	1.570
BLOCK 157	MH15	MH14	0.83	0.59	0.49	1.48	72.97	0.300	0.300	103.20	2.30	450	0.432	2.719	0.633	12.069	1.769
BLOCK 157	MH14	MH13	0.47	0.59	0.28	1.76	70.66	0.345	0.345	39.00	2.60	450	0.459	2.891	0.225	12.294	1.930
BLOCK 157	MH13	MH3	0.46	0.49	0.23	1.98	69.88	0.385	0.385	55.00	1.60	525	0.544	2.513	0.365	12.659	1.801
BLOCK 157	MH3	MH2	0.55	0.59	0.32	5.20	64.38	0.930	0.930	86.00	3.40	825	2.645	4.951	0.289	14.347	3.772
BLOCK 157	MH2	MH1	0	0.00	0.00	5.20	63.57	0.918	0.918	10.00	3.00	825	2.485	4.651	0.036	14.383	3.610
BLOCK 157	MH1	71	0	0.00	0.00	5.20	63.47	0.916	0.916	10.00	3.00	825	2.485	4.651	0.036	14.419	3.610
Alex Doner Drive	RLCB1	71	0.19	0.59	0.11	0.11	78.88	0.025	0.025	42.00	1.00	250	0.059	1.211	0.578	10.578	0.455
Alex Doner Drive	*154*	*71*	*0.08*	*0.59*	*0.05*	*6.43*	*65.73*	*1.174*	*1.414*	*36.00*	*0.29*	*1050*	*1.470*	*1.698*	*0.353*	*13.947*	*1.896*
Crossland Gate	*87*	*86*	*0.6*	*0.59*	*0.35*	*0.35*	*78.88*	*0.078*	*0.078*	*77.00*	*0.96*	*375*	*0.172*	*1.555*	*0.825*	*10.825*	*0.804*
Crossland Gate	*86*	*85*	*0.31*	*0.59*	*0.18*	*0.54*	*75.36*	*0.112*	*0.112*	*50.00*	*0.80*	*450*	*0.255*	*1.603*	*0.520*	*11.345*	*0.894*
Crossland Gate	*85*	*77*	*0.8*	*0.59*	*0.47*	*1.01*	*73.31*	*0.205*	*0.205*	*122.00*	*2.20*	*525*	*0.638*	*2.947*	*0.690*	*12.035*	*1.644*
Fairway Garden	*83*	*82*	*0.87*	*0.59*	*0.51*	*0.51*	*78.88*	*0.112*	*0.112*	*70.00*	*1.03*	*375*	*0.178*	*1.611*	*0.724*	*10.724*	*0.899*
Fairway Garden	*82*	*81*	*0.78*	*0.59*	*0.46*	*0.97*	*75.77*	*0.205*	*0.205*	*89.80*	*0.78*	*450*	*0.252*	*1.583*	*0.945*	*11.669*	*1.084*
Fairway Garden	*81*	*80*	*0.23*	*0.59*	*0.14*	*1.11*	*72.10*	*0.222*	*0.222*	*22.70*	*0.70*	*525*	*0.360*	*1.662*	*0.228*	*11.897*	*1.138*
Fairway Garden	*80*	*79*	*0.24*	*0.59*	*0.14*	*1.25*	*71.27*	*0.248*	*0.248*	*23.00*	*0.87*	*525*	*0.401*	*1.853*	*0.207*	*12.104*	*1.268*
Fairway Garden	*79*	*78*	*0.5*	*0.59*	*0.30*	*1.55*	*70.54*	*0.303*	*0.303*	*69.00*	*0.78*	*600*	*0.542*	*1.918*	*0.600*	*12.704*	*1.374*
Fairway Garden	*78*	*77*	*0*	*0.59*	*0.00*	*1.55*	*68.51*	*0.294*	*0.294*	*11.00*	*0.35*	*600*	*0.363*	*1.285*	*0.143*	*12.846*	*1.033*
Crossland Gate	*77*	*76*	*0.34*	*0.59*	*0.20*	*2.76*	*68.05*	*0.521*	*0.521*	*45.00*	*1.20*	*675*	*0.920*	*2.573*	*0.291*	*13.138*	*1.997*
Crossland Gate	*76*	*75*	*0.38*	*0.59*	*0.22*	*2.98*	*67.12*	*0.556*	*0.556*	*56.40*	*0.67*	*750*	*0.911*	*2.063*	*0.456*	*13.593*	*1.739*
Crossland Gate	*75*	*74*	*0.25*	*0.59*	*0.15*	*3.13*	*65.73*	*0.571*	*0.571*	*45.10*	*0.89*	*750*	*1.050*	*2.377*	*0.316*	*13.910*	*1.943*
Crossland Gate	*74*	*73*	*0.49*	*0.59*	*0.29*	*3.42*	*64.81*	*0.615*	*0.615*	*74.50*	*0.40*	*825*	*0.907*	*1.698*	*0.731*	*14.641*	*1.551*
Crossland Gate	*73*	*72*	*0.52*	*0.59*	*0.31*	*3.72*	*62.77*	*0.649*	*0.649*	*60.20*	*1.23*	*825*	*1.591*	*2.978*	*0.337*	*14.978*	*2.353*
Crossland Gate	*72*	*70*	*0*	*0.59*	*0.00*	*3.72*	*61.88*	*0.640*	*0.640*	*16.00*	*0.16*	*900*	*0.724*	*1.138*	*0.234*	*15.212*	*1.166*
Easement	*DICB-4*	*71*	*9.93*	*0.21*	*2.07*	*2.07*	*78.88*	*0.453*	*0.453*	*40.00*	*1.35*	*675*	*0.976*	*2.729*	*0.244*	*10.244*	*1.998*
Alex Doner Drive	*71*	*70*	*0.15*	*0.59*	*0.09*	*13.89*	*63.37*	*2.446*	*2.686*	*66.50*	*1.25*	*1200*	*4.357*	*3.854*	*0.288*	*14.707*	*4.156*
Pond #6	*70*	*Pond-6-IN*	*0*	*0.59*	*0.00*	*17.62*	*61.28*	*2.999*	*3.239*	*112.00*	*0.18*	*1500*	*2.998*	*1.697*	*1.100*	*16.312*	*1.935*

EL. FROM CENTRELINE TO BASEMENT (m)= 1.76
ALLOWABLE DISTANCE FROM BASEMENT TO HGL (m)= 0.50
STARTING DOWNSTREAM HGL (if above obvert) (m) = 267.85

ICD Types	CB on Grade Flow (m^3/s)	CB in Sag Flow (m^3/s)	DCB in Sag Flow (m^3/s)
Type "A"	0.0198	0.022	-
Type "B"	0.0283	0.0305	-
Type "C"	0.0368	0.04	-
No ICD	0.06	0.1	0.17

Conection for: STREET A and CONDO BLOCK 157

Marianneville Developments Ltd.
(Tributary to Pond # 6)

Intensity Formula:

$I_{5yr} = \frac{648}{(Tc + 4)^{0.798}}$

$I_{100yr} = \frac{1770}{(Tc + 4)^{0.82}}$

100 YEAR & HYDRAULIC GRADE LINE ANALYSIS
(Existing condition with proposed development)

Project: Marianeville Developments Ltd.
Project No: L09-301
Date: Nov. 22, 2013
Designed by: B.A.

S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development - Newmarket\Calcs\Pipe Design\Storm Design\[L09-301-PROP-STORM-100year__HGL.xls]HGL

STREET	MH FROM	MH TO	100-YR AREA (m^2)	ACC. 100 YR AREA (m^2)	100-YR runoff coefficient "R"	ACC. 5-YR FLOW (m^3/s)	100-YR rainfall intesity (mm/hr)	ACC. 100 YR FLOW (m^3/s)	ACC. Time of Concentration (min)	ICD's: No. CBs ON GRADE No ICD	ON GRADE ICD Type "A"	ON GRADE ICD Type "B"	ON GRADE ICD Type "C"	No. CBs IN SAG No ICD	IN SAG ICD Type "A"	IN SAG ICD Type "B"	IN SAG ICD Type "C"	No. DCBs IN SAG No ICD	No. SCB IN SAG No ICD	CAPTURED FLOW BY CB (m^3/s)	ACC. CB FLOW (m^3/s)	PIPE DATA 1 Pipe Slope (%)	2 HGL Downstream (m)	3 Pipe Diameter Do (mm)	MH Diameter (mm)	Pipe Area (m^2)	HYD RAD	4 Q100YR Min (Q 100year, Acc. CB Q)	Qcap (m^3/s)	5 Lo Length of Pipe (m)	SURCHARGED PIPE U/S HGL 19 EGLo 2+7	20 EGLi 10+18+19	21 U/S HGL EGL-7	22 U/S Ovb	HGL VS BASEMENT: HGL Max (21, 21a, 22)	Pipe Check	Service Conn. (Y/N)	MH Top U/S (m)	FFF (U/S)	Basement Floor (m)
Kirby Crescent	Tower	257	0.14	0.14	0.63	0.01	203.31	0.05	10.13	0	0	0	0	0	0	0	0	0	0	0.000	0.00	4.49	298.49	300	1,200	0.07	0.08	0.01	0.20	23.00	298.49	298.49	298.49	293.42	298.49	Surcharged	N	295.70	296.48	293.94
Kirby Crescent	257	256	0.77	0.91	0.80	0.11	201.74	0.39	10.60	2	0	0	0	0	0	0	0	0	0	0.120	0.12	2.50	297.44	300	1,200	0.07	0.08	0.12	0.15	60.50	297.59	298.64	298.49	292.14	298.49	Surcharged	Y	295.60	296.38	293.84
Kirby Crescent	256	255	0.70	1.61	0.80	0.19	196.45	0.69	11.01	3	0	0	0	0	0	0	0	0	0	0.180	0.30	4.84	294.76	375	1,200	0.11	0.09	0.30	0.39	85.70	295.14	297.82	297.44	290.01	297.44	Surcharged	Y	293.20	293.98	291.44
Kirby Crescent	255	254	0.60	2.21	0.80	0.26	192.05	0.93	11.46	3	0	0	0	0	0	0	0	0	0	0.180	0.48	3.86	288.09	375	1,200	0.11	0.09	0.48	0.34	84.40	289.05	295.73	294.76	285.11	294.76	Surcharged	Y	288.00	288.78	286.24
Kirby Crescent	254	253	0.19	2.40	0.80	0.28	187.44	0.99	11.60	0	0	0	0	0	0	0	0	0	0	0.000	0.48	2.66	287.22	450	1,200	0.16	0.11	0.48	0.46	25.20	287.68	288.55	288.09	281.20	288.09	Surcharged	Y	284.60	285.38	282.84
Kirby Crescent	253	248	0.23	2.63	0.80	0.31	186.02	1.07	11.86	2	0	0	0	0	0	0	0	0	0	0.120	0.60	3.16	284.66	450	1,200	0.16	0.11	0.60	0.51	48.60	285.39	287.94	287.22	280.30	287.22	Surcharged	N	284.10	284.88	282.34
Kirby Crescent	CB-1	262	0.11	0.11	0.80	0.01	203.31	0.05	10.12	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	295.10	250	1,200	0.05	0.06	0.05	0.06	8.50	295.15	295.26	295.21	291.34	295.21	Surcharged	N	293.00	293.78	291.24
Kirby Crescent	CB-2	262	0.33	0.33	0.80	0.04	203.31	0.15	10.12	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	295.10	300	1,200	0.07	0.08	0.06	0.10	10.00	295.14	295.20	295.16	291.40	295.16	Surcharged	N	293.00	293.78	291.24
Kirby Crescent	262	260	0.06	0.50	0.80	0.07	201.87	0.22	10.20	0	0	0	0	0	0	0	0	0	0	0.000	0.12	4.97	294.79	300	1,200	0.07	0.08	0.12	0.22	14.00	294.94	295.25	295.10	289.73	295.10	Surcharged	Y	292.40	293.18	290.64
Kirby Crescent	260	259	0.59	1.09	0.80	0.14	200.97	0.49	10.54	2	0	0	0	0	0	0	0	0	0	0.120	0.24	4.59	290.67	300	1,200	0.07	0.08	0.24	0.21	60.50	291.25	295.38	294.79	288.67	294.79	Surcharged	Y	291.50	292.28	289.74
Kirby Crescent	259	258	0.60	1.69	0.80	0.22	197.07	0.74	10.82	2	0	0	0	0	0	0	0	0	0	0.120	0.36	5.00	287.98	375	1,200	0.11	0.09	0.36	0.39	58.40	288.52	291.21	290.67	285.69	290.67	Surcharged	Y	288.20	288.98	286.44
Kirby Crescent	258	252	0.88	2.57	0.80	0.32	194.07	1.11	11.25	2	0	0	0	0	0	0	0	0	0	0.120	0.48	4.71	280.82	375	1,200	0.11	0.09	0.48	0.38	89.00	281.78	288.94	287.98	282.55	287.98	Surcharged	Y	285.20	285.98	283.44
Kirby Crescent	252	251	0.48	3.05	0.80	0.37	189.57	1.28	11.63	1	0	0	0	0	0	0	0	0	0	0.060	0.54	1.73	279.77	525	1,200	0.22	0.13	0.54	0.57	60.10	280.09	281.14	280.82	278.02	280.82	Surcharged	Y	281.00	281.78	279.24
Kirby Crescent	251	250	0.32	3.37	0.80	0.41	185.74	1.39	11.95	2	0	0	0	0	0	0	0	0	0	0.120	0.66	0.92	279.24	600	1,200	0.28	0.15	0.66	0.59	40.20	279.52	280.05	279.77	276.75	279.77	Surcharged	Y	280.00	280.78	278.24
Kirby Crescent	250	274	0.31	3.68	0.80	0.44	182.67	1.49	12.31	2	0	0	0	0	0	0	0	0	0	0.120	0.78	1.53	278.16	600	1,200	0.28	0.15	0.78	0.76	57.00	278.55	279.63	279.24	277.23	279.24	Surcharged	Y	279.40	280.18	277.64
Alex Doner Drive	Pond-3	245	0.00	0.00	0.80	0.00	203.31	0.00	10.69	0	0	0	0	0	0	0	0	0	1	0.240	0.24	1.15	287.57	450	1,200	0.16	0.11	0.00	0.31	80.00	287.57	287.57	287.57	284.93	287.57	Surcharged	N	284.48	285.26	282.72
Alex Doner Drive	245	246	0.17	0.17	0.80	0.02	195.40	0.07	11.01	0	0	0	0	0	0	0	0	0	0	0.000	0.24	0.93	287.56	525	1,200	0.22	0.13	0.07	0.41	36.00	287.57	287.58	287.57	282.92	287.57	Surcharged	Y	288.10	288.88	286.34
Alex Doner Drive	246	247	0.37	0.54	0.80	0.07	192.05	0.23	11.45	2	0	0	0	0	0	0	0	0	0	0.120	0.36	1.33	287.37	525	1,200	0.22	0.13	0.23	0.50	60.80	287.42	287.62	287.56	283.40	287.56	Surcharged	Y	288.20	288.98	286.44
Alex Doner Drive	247	270	0.56	1.10	0.80	0.13	187.53	0.46	11.91	2	0	0	0	0	0	0	0	0	0	0.120	0.48	1.59	286.50	525	1,200	0.22	0.13	0.46	0.54	70.00	286.73	287.59	287.37	282.45	287.37	Surcharged	Y	287.10	287.88	285.34
Alex Doner Drive	CBMH	270	1.32	1.32	0.63	0.07	203.31	0.47	10.27	1	0	0	0	0	0	0	0	0	0	0.060	0.06	7.00	286.50	250	1,200	0.05	0.06	0.07	0.16	51.00	286.61	287.57	287.46	284.27	287.46	Surcharged	N	286.70	287.48	284.94
Alex Doner Drive	270	248	0.42	2.84	0.80	0.25	183.02	1.04	12.25	2	0	0	0	0	0	0	0	0	0	0.120	0.66	3.13	284.66	525	1,200	0.22	0.13	0.66	0.76	70.00	285.14	286.97	286.50	281.11	286.50	Surcharged	Y	286.00	286.78	284.24
Alex Doner Drive	248	249	0.26	5.73	0.80	0.57	179.95	2.16	12.51	2	0	0	0	0	0	0	0	0	0	0.120	1.38	2.31	281.77	600	1,200	0.28	0.15	1.38	0.93	52.00	282.98	285.88	284.66	278.79	284.66	Surcharged	Y	283.80	284.58	282.04
Alex Doner Drive	249	274	0.35	6.08	0.80	0.60	177.60	2.27	12.73	2	0	0	0	0	0	0	0	0	0	0.120	1.50	3.20	278.16	600	1,200	0.28	0.15	1.50	1.10	52.00	279.60	283.20	281.77	277.37	281.77	Surcharged	Y	281.30	282.08	279.54
Alex Doner Drive	274	264	0.13	9.89	0.80	1.03	175.65	3.74	12.89	2	0	0	0	0	0	0	0	0	0	0.120	2.40	1.66	276.67	750	1,500	0.44	0.19	2.40	1.43	31.30	278.17	279.67	278.16	275.50	278.16	Surcharged	Y	279.10	279.88	277.34
Alex Doner Drive	264	265	0.26	10.15	0.80	1.05	174.28	3.81	13.06	2	0	0	0	0	0	0	0	0	0	0.120	2.52	2.06	275.24	825	1,500	0.53	0.21	2.52	2.06	39.40	276.37	277.80	276.67	271.98	276.67	Surcharged	Y	277.90	278.68	276.14
Alex Doner Drive	265	266	0.60	10.75	0.80	1.11	172.85	4.01	13.47	2	0	0	0	0	0	0	0	0	0	0.120	2.64	1.96	271.89	825	1,500	0.53	0.21	2.64	2.01	91.50	273.13	276.48	275.24	271.05	275.24	Surcharged	Y	276.30	277.08	274.54
Easement	RLCB	CBMH1	0.80	0.80	0.80	0.11	203.31	0.36	10.63	1	0	0	0	0	0	0	0	0	0	0.060	0.06	0.69	272.80	375	1,200	0.11	0.09	0.11	0.15	50.00	272.84	273.04	272.99	269.12	272.99	Surcharged	N	270.60	271.38	268.84
Easement	CBMH1	CBMH2	0.14	0.94	0.63	0.11	196.08	0.40	10.86	1	0	0	0	0	0	0	0	0	0	0.060	0.12	0.75	272.68	375	1,200	0.11	0.09	0.12	0.15	19.00	272.74	272.86	272.80	268.75	272.80	Surcharged	N	271.30	272.08	269.54
Easement	CBMH2	267	0.00	0.94	0.63	0.11	193.58	0.39	11.36	1	0	0	0	0	0	0	0	0	0	0.060	0.18	0.69	272.23	375	1,200	0.11	0.09	0.18	0.15	39.00	272.36	272.82	272.68	268.58	272.68	Surcharged	N	271.70	272.48	269.94
Easement	267	266	0.00	0.94	0.63	0.10	188.47	0.38	11.50	0	0	0	0	0	0	0	0	0	0	0.000	0.18	1.30	271.89	375	1,200	0.11	0.09	0.18	0.20	15.50	272.02	272.36	272.23	268.52	272.23	Surcharged	N	272.60	273.38	270.84
Easement	266	154	0.05	11.74	0.80	1.19	169.56	4.29	13.59	2	0	0	0	0	0	0	0	0	0	0.120	2.94	2.94	270.10	825	1,500	0.53	0.21	2.94	2.46	34.50	271.64	273.43	271.89	268.34	271.89	Surcharged	N	272.40	273.18	270.64
Alex Doner Drive	154	71	0.08	11.82	0.80	1.19	168.57	4.30	13.95	0	0	0	0	0	0	0	0	0	0	0.000	2.94	0.29	269.66	1,050	2,400	0.87	0.26	2.94	1.47	36.00	270.25	270.69	270.10	267.95	270.10	Surcharged	N	271.63	272.41	269.87
Crossland Gate	87	86	0.60	0.60	0.80	0.08	203.31	0.27	10.83	4	0	0	0	0	0	0	0	0	0	0.240	0.24	0.96	274.56	375	1,200	0.11	0.09	0.24	0.17	77.00	274.80	276.33	276.09	271.91	276.09	Surcharged	Y	274.80	275.58	273.04
Crossland Gate	86	85	0.31	0.91	0.80	0.11	193.98	0.39	11.34	0	0	0	0	0	0	0	0	0	0	0.000	0.24	0.80	274.15	450	1,200	0.16	0.11	0.24	0.25	50.00	274.27	274.68	274.56	271.10	274.56	Surcharged	Y	274.00	274.78	272.24
Crossland Gate	85	77	0.80	1.71	0.80	0.21	188.58	0.72	12.03	4	0	0	0	0	0	0	0	0	0	0.240	0.48	2.20	272.52	525	1,200	0.22	0.13	0.48	0.64	122.00	272.77	274.41	274.15	271.58	274.15	Surcharged	Y	273.50	274.28	271.74
Fairway Garden	83	82	0.87	0.87	0.80	0.11	203.31	0.39	10.72	4	0	0	0	0	0	0	0	0	0	0.240	0.24	1.03	274.86	375	1,200	0.11	0.09	0.24	0.18	70.00	275.10	276.53	276.29	271.28	276.29	Surcharged	Y	273.80	274.58	272.04
Fairway Garden	82	81	0.78	1.65	0.80	0.21	195.07	0.72	11.67	2	0	0	0	0	0	0	0	0	0	0.120	0.36	0.78	273.35	450	1,200	0.16	0.11	0.36	0.25	89.80	273.61	275.12	274.86	270.58	274.86	Surcharged	Y	273.40	274.18	271.64
Fairway Garden	81	80	0.23	1.88	0.80	0.23	185.37	0.77	11.90	0	0	0	0	0	0	0	0	0	0	0.000	0.36	0.70	273.16	525	1,200	0.22	0.13	0.36	0.36	22.70	273.30	273.49	273.35	268.86	273.35	Surcharged	Y	272.70	273.48	270.94
Fairway Garden	80	79	0.24	2.12	0.80	0.25	183.19	0.86	12.10	0	0	0	0	0	0	0	0	0	0	0.000	0.36	0.87	272.96	525	1,200	0.22	0.13	0.36	0.40	23.00	273.10	273.30	273.16	269.10	273.16	Surcharged	Y	272.50	273.28	270.74
Fairway Garden	79	78	0.50	2.62	0.80	0.31	181.25	1.06	12.70	0	0	0	0	0	0	0	0	0	0	0.000	0.36	0.78	272.70	600	1,200	0.28	0.15	0.36	0.54	69.00	272.78	273.04	272.96	269.71	272.96	Surcharged	Y	272.30	273.08	270.54
Fairway Garden	78	77	0.00	2.62	0.80	0.30	175.90	1.02	12.85	4	0	0	0	0	0	0	0	0	0	0.240	0.60	0.35	272.52	600	1,200	0.28	0.15	0.60	0.36	11.00	272.75	272.93	272.70	269.73	272.70	Surcharged	Y	272.20	272.98	270.44
Crossland Gate	77	76	0.34	4.67	0.80	0.53	174.68	1.81	13.14	0	0	0	0	0	0	0	0	0	0	0.000	1.08	1.20	271.67	675	1,200	0.36	0.17	1.08	0.92	45.00	272.14	272.98	272.52	269.04	272.52	Surcharged	Y	273.50	274.28	271.74
Crossland Gate	76	75	0.38	5.05	0.80	0.56	172.24	1.93	13.59	2	0	0	0	0	0	0	0	0	0	0.120	1.20	0.67	270.95	750	1,500	0.44	0.19	1.20	0.91	56.40	271.32	272.05	271.67	268.49	271.67	Surcharged	Y	271.60	272.38	269.84
Crossland Gate	75	74	0.25	5.30	0.80	0.58	168.57	1.99	13.91	0	0	0	0	0	0	0	0	0	0	0.000	1.20	0.89	270.33	750	1,500	0.44	0.19	1.20	1.05	45.10	270.71	271.32	270.95	268.14	270.95	Surcharged	Y	271.00	271.78	269.24
Crossland Gate	74	73	0.49	5.79	0.80	0.63	166.13	2.14	14.64	2	0	0	0	0	0	0	0	0	0	0.120	1.32	0.40	269.64	825	1,500	0.53	0.21	1.32	0.91	74.50	269.95	270.64	270.33	267.75	270.33	Surcharged	Y	270.50	271.28	268.74
Crossland Gate	73	72	0.52	6.31	0.80	0.66	160.77	2.25	14.98	3	0	0	0	0	0	0	0	0	0	0.180	1.50	1.23	268.92	825	1,200	0.53	0.21	1.50	1.59	60.20	269.32	270.04	269.64	267.34	269.64	Surcharged	Y	269.80	270.58	268.04
Crossland Gate	72	70	0.00	6.31	0.80	0.65	158.42	2.22	15.21	0	0	0	0	0	0	0	0	0	0	0.000	1.50	0.16	268.79	900	1,800	0.64	0.23	1.50	0.72	16.00	269.08	269.20	268.92	266.60	268.92	Surcharged	N	269.60	270.38	267.84
Easement	DICB-4	71	0.00	0.00	0.60	0.00	203.31	0.00	10.24	0	0	0	0	0	0	0	0	0	0	0.000	0.00	1.35	269.66	675	1,800	0.36	0.17	0.00	0.98	40.00	269.66	269.66	269.66	268.02	269.66	Surcharged	N	269.45	270.23	267.69
Alex Doner Drive	71	70	0.15	21.67	0.80	2.18	162.64	7.68	14.67	2	0	0	0	0	0	0	0	0	0	0.120	4.35	1.25	268.79	1,200	2,400	1.13	0.30	4.35	4.36	66.50	269.55	270.41	269.66	267.05	269.66	Surcharged	Y	270.00	270.78	268.24
Pond #6	70	Pond-6-IN	0.00	27.98	0.80	2.75	156.84	9.61	16.31	0	0	0	0	0	0	0	0	0	0	0.000	5.85	0.18	268.00	1,500	2,400	1.77	0.38	5.85	3.00	112.00	268.56	269.35	268.79	266.80	268.79	Surcharged	Y	269.64	270.42	267.88
STREET A	RLCB10	MH12	0.17	0.17	0.80	0.02	203.31	0.08	10.62	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	275.72	250	750	0.05	0.06	0.06	0.06	45.00	275.80	276.30	276.22	274.36	276.22	Surcharged	N	275.56	276.34	273.80
STREET A	RLCB9	MH12	0.16	0.16	0.80	0.02	203.31	0.07	10.78	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	275.72	250	750	0.05	0.06	0.06	0.06	57.00	275.80	276.42	276.34	274.65	276.34	Surcharged	N	275.85	276.63	274.09
STREET A	MH12	MH11	0.59	0.92	0.80	0.11	194.42	0.39	11.44	0	0	0	0	0	0	0	0	0	0	0.000	0.12	1.40	274.73	300	1,200	0.07	0.08	0.12	0.11	64.00	274.88	275.87	275.72	274.66	275.72	Surcharged	Y	280.00	280.78	278.24
STREET A	MH11	MH10	0.40	1.32	0.80	0.16	187.59	0.55	11.89	0	0	2	0	0	0	0	0	0	0	0.057	0.18	1.80	274.46	450	1,200	0.16	0.11	0.18	0.38	64.00	274.53	274.79	274.73	274.16	274.73	Surcharged	Y	279.13	279.91	277.37
STREET A	MH10	MH9	0.24	1.56	0.80	0.18	183.28	0.63	12.11	0	0	2	0	0	0	0	0	0	0	0.057	0.23	2.00	274.21	450	1,200	0.16	0.11	0.23	0.40	34.00	274.32	274.57	274.46	273.01	274.46	Surcharged	Y	278.08	278.86	276.32
STREET A	RLCB8	MH9	0.19	0.19	0.80	0.02	203.31	0.09	10.76	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	274.21	250	750	0.05	0.06	0.06	0.06	55.00	274.28	274.85	274.77	273.93	274.77	Surcharged	N	275.13	275.91	273.37
STREET A	MH9	MH8	0.10	1.85	0.80	0.21	181.20	0.74	12.26	0	0	0	0	0	0	0	0	0	0	0.000	0.29	2.40	273.87	450	1,200	0.16	0.11	0.29	0.44	24.50	274.05	274.38	274.21	272.35	274.21	Surcharged	Y	277.24	278.02	275.48
STREET A	RLCB7	MH8	0.23	0.23	0.80	0.03	203.31	0.10	10.77	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	273.87	250	750	0.05	0.06	0.06	0.06	56.00	273.95	274.61	274.53	272.92	274.53	Surcharged	N	274.10	274.88	272.34
STREET A	RLCB6	MH8	0.24	0.24	0.80	0.03	203.31	0.11	10.74	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	273.87	250	750	0.05	0.06	0.06	0.06	54.00	273.95	274.59	274.51	271.54	274.51	Surcharged	N	272.74	273.52	270.98
STREET A	MH8	MH7	0.78	3.10	0.80	0.36	179.85	1.23	12.63	0	0	2	0	0	0	0	0	0	0	0.057	0.47	2.00	273.06	525	1,200	0.22	0.13	0.47	0.61	62.00	273.30	274.11	273.87	271.87	273.87	Surcharged	Y	276.65	277.43	274.89
STREET A	RLCB5	MH7	0.24	0.24	0.80	0.03	203.31	0.11	10.83	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	273.06	250	750	0.05	0.06	0.06	0.06	60.00	273.14	273.85	273.77	270.68	273.77	Surcharged	N	271.88	272.66	270.12
STREET A	MH7	MH6	0.74	4.08	0.80	0.46	176.58	1.59	13.13	0	0	0	0	0	0	0	0	0	0	0.000	0.53	0.75	272.59	600	1,200	0.28	0.15	0.53	0.53	57.00	272.77	273.24	273.06	270.68	273.06	Surcharged	Y	275.87	276.65	274.11
STREET A	RLCB4	MH6	0.27	0.27	0.80	0.03	203.31	0.12	10.81	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	272.59	250	750	0.05	0.06	0.06	0.06	59.00	272.67	273.37	273.30	270.15	273.30	Surcharged	N	271.35	272.13	269.59
STREET A	MH6	MH5	0.44	4.79	0.80	0.53	172.30	1.82	13.48	0	0	2	0	0	0	0	0	0	0	0.057	0.65	0.75	272.10	600	1,200	0.28	0.15	0.65	0.53	39.00	272.36	272.86	272.59	270.24	272.59	Surcharged	Y	275.43	276.21	273.67
STREET A	MH5	MH4	0.19	5.20	0.80	0.56	169.50	1.95	13.76	0	0	0	0	0	0	0	0	0	0	0.000	0.71	0.75	271.85	675	1,200	0.36	0.17	0.71	0.73	34.60	272.05	272.29	272.10	270.84	272.10	Surcharged	Y	275.13	275.91	273.37
STREET A	RLCB3	MH5	0.22	0.22	0.80	0.03	203.31	0.10	10.74	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	272.10	250	750	0.05	0.06	0.06	0.06	54.00	272.17	272.84	272.76	269.80	272.76	Surcharged	N	271.00	271.78	269.24
STREET A	RLCB2	MH4	0.14	0.14	0.80	0.02	203.31	0.06	10.84	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	271.85	250	750	0.05	0.06	0.06	0.06	61.00	271.92	272.66	272.58	269.41	272.58	Surcharged	N	270.61	271.39	268.85
STREET A	MH4	MH3	0.18	5.52	0.80	0.59	167.28	2.04	14.02	0	0	2	0	0	0	0	0	0	0	0.057	0.82	1.00	271.42	675	1,200	0.36	0.17	0.82	0.84	36.50	271.69	272.12	271.85	269.79	271.85	Surcharged	Y	274.70	275.48	272.94
BLOCK 157	EXT	MH17	0.23	0.23	0.80	0.03	203.31	0.10	10.14	0	0	0	0	0	0	0	0	0	0	0.000	0.00	1.00	279.14	250	1,200	0.05	0.06	0.03	0.06	10.00	279.15	279.18	279.16	279.11	279.16	Surcharged	Y	281.88	282.66	280.12
BLOCK 157	MH17	MH16	0.73	0.96	0.80	0.12	201.68	0.43	10.88	0	0	0	0	0	0	0	0	0	0	0.000	0.00	1.60	277.69	375	1,200	0.11	0.09	0.12	0.22	90.00	277.75	278.20	278.14	279.14	279.14	OK	Y	281.88	282.66	280.12
BLOCK 157	MH16	MH15	0.72	1.68	0.80	0.21	193.34	0.72	11.44	0	0	4	0	0	0	0	0	0	0	0.113	0.11	2.30	275.62	450	1,200	0.16	0.11	0.21	0.43	90.00	275.71	276.18	276.10	277.69	277.69	OK	Y	280.13	280.91	278.37
BLOCK 157	MH15	MH14	0.83	2.51	0.80	0.30	187.66	1.04	12.07	0	0	4	0	0	0	0	0	0	0	0.113	0.23	2.30	273.25	450	1,200	0.16	0.11	0.30	0.43	103.20	273.44	274.58	274.40	275.62	275.62	OK	Y	278.35	279.13	276.59
BLOCK 157	MH14	MH13	0.47	2.98	0.80	0.35	181.58	1.19	12.29	0	0	0	0	0	0	0	0	0	0	0.000	0.23	2.60	272.32	450	1,200	0.16	0.11	0.35	0.46	39.00	272.55	273.13	272.89	273.25	273.25	OK	Y	275.98	276.76	274.22
BLOCK 157	MH13	MH3	0.46	3.44	0.80	0.39	179.52	1.36	12.66	0	0	0	0	0	0	2	0	0	0	0.061	0.29	1.60	271.42	525	1,200	0.22	0.13	0.39	0.54	55.00	271.59	272.05	271.88	272.32	272.32	OK	Y	274.13	274.91	272.37
BLOCK 157	MH3	MH2	0.55	9.51	0.80	1.01	165.31	3.47	14.31	0	0	0	0	0	0	2	0	0	0	0.061	1.17	3.40	269.86	825	1,500	0.53	0.21	1.17	2.65	86.00	270.11	270.69	270.44	271.42	271.42	OK	Y	274.13	274.91	272.37
BLOCK 157	MH2	MH1	0.00	9.51	0.80	0.99	163.16	3.43	14.34	0	0	0	0	0	0	2	0	0	0	0.061	1.23	3.00	269.74	825	1,500	0.53	0.21	1.23	2.48	10.00	270.02	270.14	269.86	268.13	269.86	Surcharged	N	271.42	272.20	269.66
BLOCK 157	MH1	71	0.00	9.51	0.80	0.99	162.90	3.42	14.38	0	0	0	0	0	0	0	0	0	0	0.000	1.23	3.00	269.66	825	1,500	0.53	0.21	1.23	2.48	10.00	269.93	270.02	269.74	267.63	269.74	Surcharged	N	271.30	272.08	269.54
Alex Doner Drive	RLCB1	71	0.19	0.19	0.80	0.02	203.31	0.09	10.58	1	0	0	0	0	0	0	0	0	0	0.060	0.06	1.00	267.85	250	750	0.05	0.06	0.06	0.06	42.00	267.93	268.36	268.28	267.70	268.28	Surcharged	N	271.00	271.78	269.24

APPENDIX B.4
100-Year Storm Sewer Design Sheets
(Southeast Drainage Shed)

EL. FROM CENTRELINE TO BASEMENT (m)= 1.76
ALLOWABLE DISTANCE FROM BASEMENT TO HGL (m)= 0.50
STARTING DOWNSTREAM HGL (if above obvert) (m) = 267.85

ICD Types	CB on Grade Flow (m^3/s)	CB in Sag Flow (m^3/s)	DCB in Sag Flow (m^3/s)
Type "A"	0.0198	0.022	-
Type "B"	0.0283	0.0305	-
Type "C"	0.0368	0.04	-
No ICD	0.06	0.1	0.17

Connection for STREET D

Marianneville Developments Ltd.
(Tributary to Pond # 9)
Town of Newmarket

Intensity Formula:

$$I_{5yr} = \frac{648}{(Tc + 4)^{0.798}}$$

$$I_{100yr} = \frac{1770}{(Tc + 4)^{0.82}}$$

100 YEAR & HYDRAULIC GRADE LINE ANALYSIS

Project: Marianneville Developments Ltd.
Project No: L09-301
Date: Nov. 20, 2013
Designed by: B.A.

S:\2009 Projects\Land Dev Projects (L09)\2009 Subdivision Projects\L09-301 Marianneville Development - Newmarket\Calcs\Pipe Design\Storm Design\L09-301-POND-9-100year__HGL.xls\HGL PRESENTATION

STREET	MH		100-YR AREA (m^2)	ACC. 100 YR AREA (m^2)	100-YR runoff coefficient "R"	ACC. 5-YR FLOW (m^3/s)	100-YR rainfall intesity (mm/hr)	ACC. 100 YR FLOW (m^3/s)	ACC. Time of Concentration (min)	ICD's											ACC. CB FLOW (m^3/s)	PIPE DATA										SURCHARGED PIPE				HGL VS BASEMENT					
										No. CBs ON GRADE				No. CBs IN SAG				No. DCBs IN SAG	No. SCB IN SAG	CAPTURED FLOW BY CB											U/S HGL								
																				(m^3/s)		1	2	3				4		5	19	20	21	22						
	FROM	TO								No ICD	ICD Type "A"	ICD Type "B"	ICD Type "C"	No ICD	ICD Type "A"	ICD Type "B"	ICD Type "C"	No ICD	No ICD			Pipe Slope (%)	HGL Downstream (m)	Pipe Diameter Do (mm)	MH Diameter (mm)	Pipe Area (m^2)	HYD RAD	Q100YR Min (Q 100year, Acc. CB Q)	Qcap (m^3/s)	Lo Length of Pipe (m)	EGLo 2+7	EGLi 10+18+19	U/S HGL EGL-7	U/S Ovb	HGL Max (21, 21a, 22)	Pipe Check	Service Conn. (Y/N)	MH Top U/S (m)	FFF (U/S)	Basement Floor (m)
STREET D	MH7	MH6	0.20	0.20	0.80	0.03	203.31	0.09	10.88	2	0	0	0	0	0	0	0	0	0	0.120	0.12	1.00	269.35	300.00	1,200	0.07	0.08	0.09	0.10	72.30	269.43	270.06	269.98	269.80	269.98	Surcharged	Y	272.60	273.38	270.84
STREET B	MH6	MH5	0.80	1.00	0.80	0.12	193.38	0.43	11.76	2	0	0	0	0	0	0	0	0	0	0.120	0.24	1.00	268.66	450.00	1,200	0.16	0.11	0.24	0.28	94.70	268.78	269.47	269.35	268.72	269.35	Surcharged	Y	271.78	272.56	270.02
STREET B	MH5	MH4	1.10	2.10	0.80	0.25	184.48	0.86	12.27	2	0	0	0	0	0	0	0	0	0	0.120	0.36	1.50	268.56	750.00	1,200	0.44	0.19	0.36	1.36	94.70	268.59	268.70	268.66	268.55	268.66	Surcharged	Y	270.62	271.40	268.86
STREET B	MH3	MH2	0.96	4.16	0.80	0.46	174.46	1.60	13.24	0	0	0	0	0	0	0	0	0	0	0.000	0.60	0.50	268.19	825.00	1,200	0.53	0.21	0.60	1.01	41.80	268.26	268.40	268.34	266.17	268.34	Surcharged	N	269.38	268.88	266.34
BLOCK 159	MH2	MH1	0.00	4.16	0.78	0.46	171.41	1.57	14.24	0	0	0	0	0	0	0	0	0	0	0.000	0.60	0.50	267.90	825.00	1,200	0.53	0.21	0.60	1.01	114.00	267.97	268.26	268.19	265.98	268.19	Surcharged	N	268.10	269.01	266.47
BLOCK 159	MH1	HW	0.00	4.16	0.78	0.44	163.66	1.50	14.45	0	0	0	0	0	0	0	0	0	0	0.000	0.60	0.50	267.85	825.00	1,200	0.53	0.21	0.60	1.01	24.00	267.91	267.97	267.90	265.40	267.90	Surcharged	N	268.23	269.22	266.68

APPENDIX C
Pre-Development Input Parameters

Design Chart 1.08: Hydrologic Soil Groups (Continued)

- Based on Soil Texture

Sands, Sandy Loams and Gravels	
- overlying sand, gravel or limestone bedrock, very well drained	A
- ditto, imperfectly drained	AB
- shallow, overlying Precambrian bedrock or clay subsoil	B
Medium to Coarse Loams	
- overlying sand, gravel or limestone, well drained	AB
- shallow, overlying Precambrian bedrock or clay subsoil	B
Medium Textured Loams	
- shallow, overlying limestone bedrock	B
- overlying medium textured subsoil	BC
Silt Loams, Some Loams	
- with good internal drainage	BC
- with slow internal drainage and good external drainage	C
Clays, Clay Loams, Silty Clay Loams	
- with good internal drainage	C
- with imperfect or poor external drainage	C
- with slow internal drainage and good external drainage	D

Source: U.S. Department of Agriculture (1972)

Design Chart 1.09: Soil/Land Use Curve Numbers

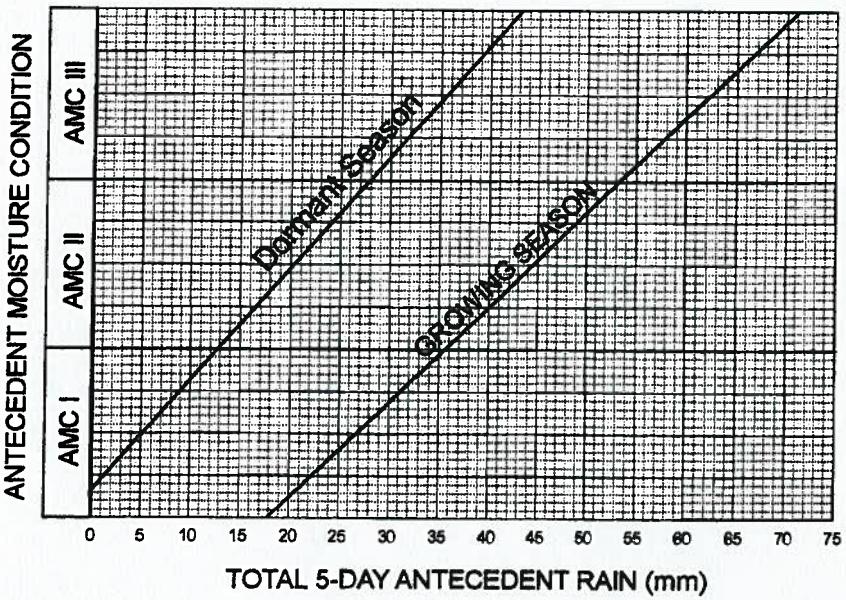
Land Use	Treatment or Practice	Hydrologic Condition[4]	Hydrologic Soil Group			
			A	B	C	D
Fallow	Straight row	—	77	86	91	94
Row crops	"	Poor	72	81	88	91
	"	Good	67	78	85	89
	Contoured	Poor	70	79	84	88
	"	Good	65	75	82	86
	" and terraced	Poor	66	74	8	82
	" " "	Good	62	71	78	81
Small grain	Straight row	Poor	65	76	84	88
		Good	63	75	83	87
	Contoured	Poor	63	74	82	85
		Good	61	73	81	84
	" and terraced	Poor	61	72	79	82
		Good	59	70	78	81
Close-seeded legumes[2] or rotation meadow	Straight row	Poor	66	77	85	89
	" "	Good	58	72	81	85
	Contoured	Poor	64	75	83	85
	"	Good	55	69	78	83
	" and terraced	Poor	63	73	80	83
	" and terraced	Good	51	67	76	80
Pasture or range		Poor	68	79	86	89
		Fair	49	69	79	84
	Contoured	Good	39	61	74	80
	"	Poor	47	67	81	88
	"	Fair	25	59	75	83
		Good	6	35	70	79
Meadow		Good	30	58	71	78
Woods		Poor	45	66	77	83
		Fair	36	60	73	79
		Good	25	55	70	77
Farmsteads		—	59	74	82	86
		—	72	82	87	89
		—	74	84	90	92

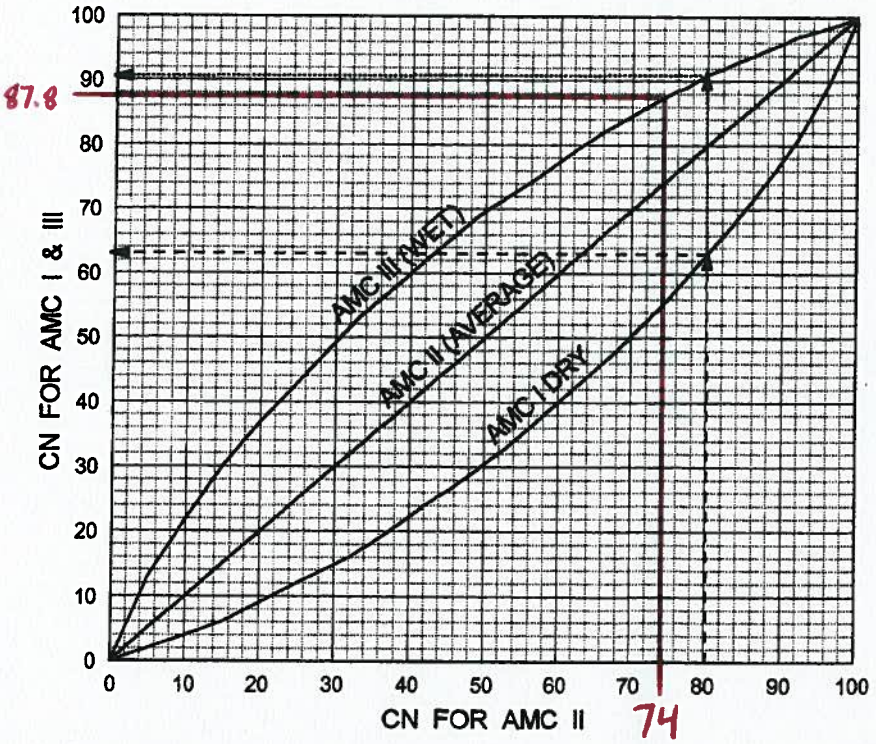
For average anticedent soil moisture condition (AMC II)
[2] Close-drilled or broadcast.

[4] The hydrologic condition of cropland is good if a good crop rotation practice is used; it is poor if one crop is grown continuously.

Source: U.S. Department of Agriculture (1972)

Design Chart 1.10: Antecedent Mosisture Condition





EXAMPLE

AMC II CN = 80
AMC I CN = 63
AMC III CN = 91

COLE ENGINEERING

Melody Giles, E.I.T.

Conversion of CN to CN*
Update to VO2 Model

Glenway C.C, The Kerbel Group / Lakeview Homes, Town of Newmarket
File No. L09-301
Date: January 2012

MTO Drainage Management Manual, 1997
Design Chart 1.09: Soil/Land Use Curve Numbers

Based on clay loam soil (Type C) determined from a soils map of York County (Soil Surveys Ontario) a CN value of 74 was determined using MTO Design Charts 1.08 and 1.09 for pasture land use under good hydrologic condition.

Note: This CN value is based on AMC II and is not applicable to frozen soils or to periods in which snowmelt contributes to runoff

Pre-Development Condition Parameters- IA, CN*

CN to CN* Convention

Assumption:

P = 117.5 mm Oak Ridges IDF Data - 24hr 100 yr storm

Subcatchment	IA (mm)	CN (AMC II)	CN (AMC III)	S	Q	IA*	S*	CN* (AMC III)	CN* (AMC II)
All	5	74.0	87.8	35.29	85.36	5.29	36.07	87.6	74.0

Notes:
IA should be set to a value in the range of 1.0 mm and 5.0 mm
CN (AMC III) from MTO Drainage Manual Design Chart 1.10

Source of Equations: Visual OTTHYMO v2.0 Reference Manual

COLE ENGINEERING

Pre-Development (OTTHYMO)
Nashyd Input Parameters
Glenway Estates
File No. L09-301
Date: January 2012

Parameter	Unit	Description	4-ex2.3	4-ex1.1	4.1	4.3	4.5	6-ex3.3	6.1	6.3	6.4	8.1	8.3	9.3	9.01	9.03
Area	ha	Watershed Area	0.91	6.53	10.18	2.59	1.61	1.33	8.03	10.64	2.11	3.28	2.90	1.34	0.10	2.51
TP	hr	Unit Hydrograph Time to Peak	0.17	0.19	0.27	0.22	0.13	0.13	0.22	0.24	0.26	0.10	0.23	0.22	0.05	0.27
DT	min	Time Step Increment	12													
DWF	cms	Dry Weather Flow (Base Flow)	0													
CN*	-	Modified SCS Curve Number	74**													
IA	mm	Initial Abstraction	5													
N	-	Number of Linear Reservior	3													
Rain	mm/hr	Optional Rainfall Intensities	0-Without Rainfall													

**** Note: Based on clay loam soil (Type C) determined from a soils map of York County (Soil Surveys Ontario). CN value of 74 was determined with MTO Design Charts 1.08 and 1.09 1.09 for pasture land use under good hydrologic condition. CN was converted to CN*.**

Time of Concentration Calculation

Area Number	Area	C_{PRE}	L	Elevation Change	Sw	Tp (Airport)
	(ha)		(m)	(m)	(m/m)	(hr)
4-ex2.3	0.91	0.30	60	2	2.5	0.17
4-ex1.1	6.53	0.30	200	20	10.0	0.19
4.1	10.18	0.30	250	12	4.8	0.27
4.3	2.59	0.20	210	20	9.5	0.22
4.5	1.61	0.20	85	10	11.8	0.13
6-ex3.3	1.33	0.20	70	7	10.0	0.13
6.1	8.03	0.30	210	15	7.1	0.22
6.3	10.64	0.30	240	16	6.7	0.24
6.4	2.11	0.20	200	12	6.0	0.26
8.1	3.28	0.30	70	9	12.9	0.10
8.3	2.21	0.20	140	7	5.0	0.23
9.3	1.34	0.30	110	3	2.7	0.22
9.01	0.10	0.20	15	2	13.3	0.05
9.03	2.51	0.30	200	7	3.5	0.27

COLE ENGINEERING

Pre-Development (OTTHYMO)
STANDHYD - Input Parameters

Glenway Estates
File No. L09-301
Date: January, 2012

Parameter	Units	Description	4-ex2.1	4-ex2.2	4-ex2.4	4-ex1.2	4-ex1.3	4.2	4.4	6-ex3.1	6-ex3.2	6.2	6.01	8.01	8.2	68.1	9.1	9.2	9.4	9.02	98.1
AREA	ha	Drainage Area	2.95	3.87	6.86	2.34	0.97	6.71	0.85	3.62	1.45	17.98	1.21	2.50	10.16	1.50	2.71	5.86	2.71	0.47	1.27
XIMP	%	Impervious Area (Direct Connection)	25.0%	61.0%	61.0%	55.0%	64.0%	71.0%	28.0%	28.0%	64.0%	61.0%	55.0%	55.0%	66.0%	64.0%	25.0%	56.0%	78.0%	70.0%	68.0%
TIMP	%	Total Impervious Area	25.0%	61.0%	61.0%	55.0%	64.0%	71.0%	28.0%	28.0%	64.0%	61.0%	55.0%	55.0%	66.0%	64.0%	25.0%	56.0%	78.0%	70.0%	68.0%
LGI	-	Overland Flow Length (Impervious)	30																		
SLPI	%	Average Slope (Impervious)	2																		
DT	min	Time Step Increment	12																		
DWF	m^3/s	Dry Weather Flow (Base Flow)	0																		
LOSS	-	Rainfall Loss Method	Loss = 2 - Modified SCS Curve Method, CN*= 74																		
SLPP	%	Average Slope (Pervious)	2																		
LGP	m	Overland Flow Length (Pervious)	20																		
MNP	-	Manning's Roughness Coefficient (Pervious)	0.25																		
DPSI	mm	Depression Storage (Impervious)	1																		
MNI	-	Manning's Roughness Coefficient (Impervious)	0.013																		

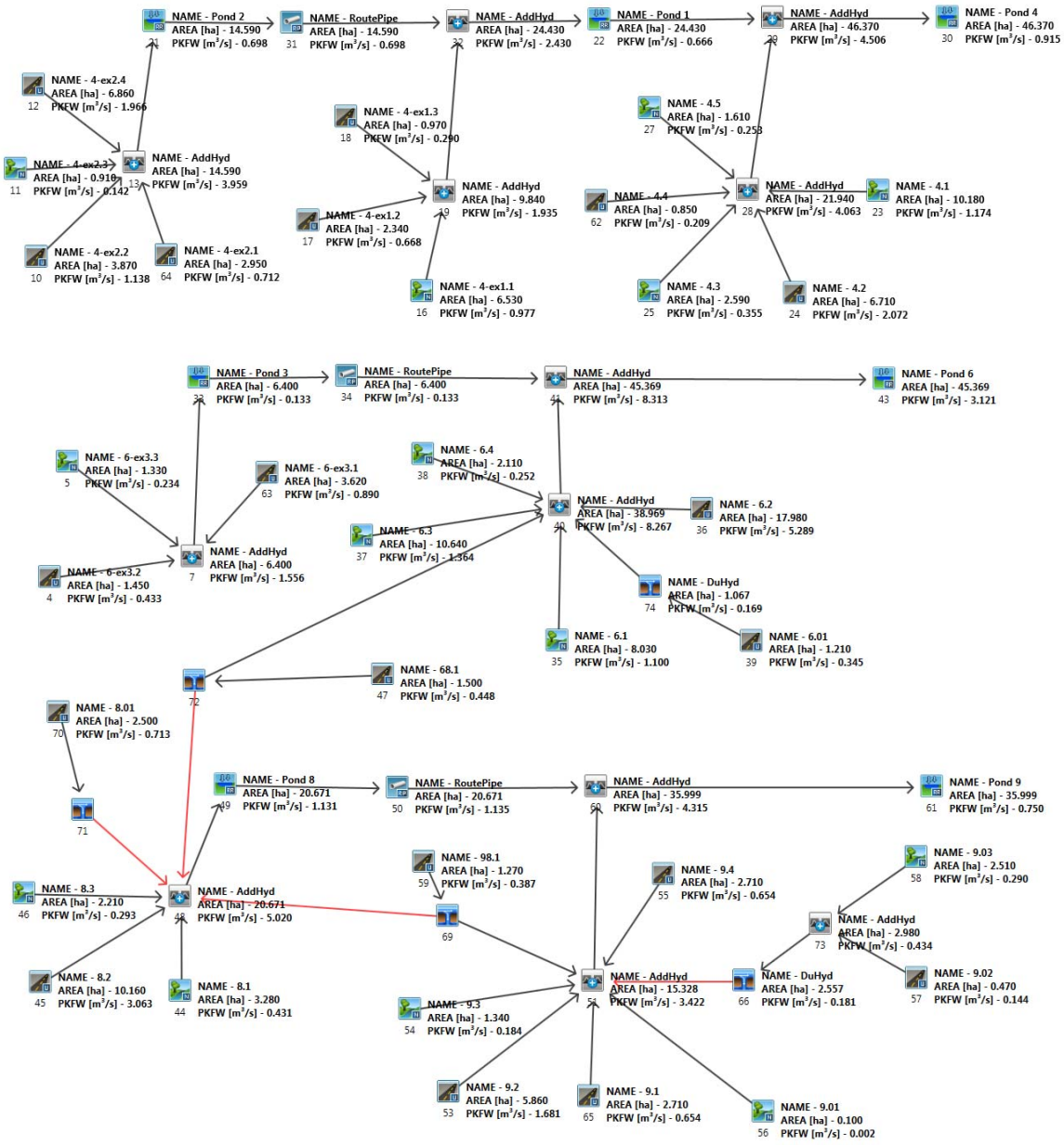
APPENDIX D
Pre-Development Hydrologic Model Output

COLE ENGINEERING

Experience Enhancing Excellence

L09-301
Glenway golf course development, Newmarket, ON
24 Hour SCS Storm Pre-Development Model Schematic
July 2013

VO2 Model Schematic



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         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O    Company
        OOO     T      T    H   H    Y    M   M   OOO                Serial

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|                 |               ata\Local\Temp\
|                 |               122dfadb-b082-4939-8279-0906fc8de536\44ae5d35
| Ptotal= 52.12 mm|     Comments: TWO YEAR SCS STORM  WITH A TWELVE MINUTE
-------------------

                TIME    RAIN |  TIME    RAIN | '  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr | '   hrs   mm/hr |   hrs   mm/hr
               0.20    0.51 |  6.20    1.02 | 12.20   10.67 | 18.20    0.76
               0.40    0.51 |  6.40    1.02 | 12.40    6.60 | 18.40    0.76
               0.60    0.51 |  6.60    1.02 | 12.60    4.83 | 18.60    0.76
               0.80    0.51 |  6.80    1.02 | 12.80    4.57 | 18.80    0.76
               1.00    0.51 |  7.00    1.02 | 13.00    3.30 | 19.00    0.76
               1.20    0.51 |  7.20    1.02 | 13.20    2.79 | 19.20    0.76
               1.40    0.51 |  7.40    1.02 | 13.40    2.79 | 19.40    0.76
               1.60    0.51 |  7.60    1.02 | 13.60    2.79 | 19.60    0.76
               1.80    0.51 |  7.80    1.02 | 13.80    2.79 | 19.80    0.76
               2.00    0.51 |  8.00    1.02 | 14.00    2.79 | 20.00    0.76
               2.20    0.51 |  8.20    1.52 | 14.20    1.52 | 20.20    0.51
               2.40    0.51 |  8.40    1.52 | 14.40    1.52 | 20.40    0.51
               2.60    0.51 |  8.60    1.52 | 14.60    1.52 | 20.60    0.51
               2.80    0.51 |  8.80    1.52 | 14.80    1.52 | 20.80    0.51
               3.00    0.51 |  9.00    1.52 | 15.00    1.52 | 21.00    0.51
               3.20    0.51 |  9.20    1.52 | 15.20    1.52 | 21.20    0.51
               3.40    0.51 |  9.40    1.52 | 15.40    1.52 | 21.40    0.51
               3.60    0.51 |  9.60    1.52 | 15.60    1.52 | 21.60    0.51
               3.80    0.51 |  9.80    1.52 | 15.80    1.52 | 21.80    0.51
               4.00    0.51 | 10.00    1.52 | 16.00    1.52 | 22.00    0.51
               4.20    1.02 | 10.20    3.05 | 16.20    1.02 | 22.20    0.51
               4.40    1.02 | 10.40    3.05 | 16.40    1.02 | 22.40    0.51
               4.60    1.02 | 10.60    3.05 | 16.60    1.02 | 22.60    0.51
               4.80    1.02 | 10.80    3.05 | 16.80    1.02 | 22.80    0.51
               5.00    1.02 | 11.00    3.05 | 17.00    1.02 | 23.00    0.51
               5.20    1.02 | 11.20    4.06 | 17.20    1.02 | 23.20    0.51
               5.40    1.02 | 11.40    5.84 | 17.40    1.02 | 23.40    0.51
               5.60    1.02 | 11.60   13.21 | 17.60    1.02 | 23.60    0.51
               5.80    1.02 | 11.80   28.96 | 17.80    1.02 | 23.80    0.51
               6.00    1.02 | 12.00   60.45 | 18.00    1.02 | 24.00    0.51

------------------------------------------------------------------------------

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| CALIB           |
| NASHYD   (0011) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min|   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.204

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  14.903
     TOTAL RAINFALL   (mm)=  52.121
     RUNOFF COEFFICIENT   =   0.286

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB           |
| STANDHYD (0010) |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min|   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
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                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.36          1.51
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      60.45         24.82
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.40          0.08       0.480 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00        12.00
     RUNOFF VOLUME    (mm)=      51.12         18.32        38.33
     TOTAL RAINFALL   (mm)=      52.12         52.12        52.12
     RUNOFF COEFFICIENT   =       0.98          0.35         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.

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| CALIB           |
| STANDHYD (0012) |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min|   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
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                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.19          2.68
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=     213.85         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      60.45         24.82
               over (min)        12.00         24.00
     Storage Coeff.  (min)=       4.00 (ii)    12.14 (ii)
     Unit Hyd. Tpeak (min)=      12.00         24.00
     Unit Hyd. peak  (cms)=       0.13          0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.68          0.11       0.765 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.20        12.00
     RUNOFF VOLUME    (mm)=      51.12         18.32        38.33
     TOTAL RAINFALL   (mm)=      52.12         52.12        52.12
     RUNOFF COEFFICIENT   =       0.98          0.35         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.

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| CALIB           |
| STANDHYD (0064) |   Area     (ha)=   2.95
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|ID= 1 DT=12.0 min | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.74	2.21
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	60.45	24.82
over (min)	12.00	12.00
Storage Coeff. (min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

		TOTALS
PEAK FLOW (cms)=	0.12	0.12	0.246 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	51.12	18.32	26.52
TOTAL RAINFALL (mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT =	0.98	0.35	0.51

***** 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 (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.480	12.00	38.33
+ ID2= 2 (0011):	0.91	0.040	12.00	14.90
ID = 3 (0013):	4.78	0.520	12.00	33.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	0.520	12.00	33.87
+ ID2= 2 (0012):	6.86	0.765	12.00	38.33
ID = 1 (0013):	11.64	1.285	12.00	36.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	1.285	12.00	36.50
+ ID2= 2 (0064):	2.95	0.246	12.00	26.52
ID = 3 (0013):	14.59	1.532	12.00	34.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	1.532	12.00	34.48
OUTFLOW: ID= 1 (0021)	14.590	0.360	12.30	34.46

PEAK FLOW REDUCTION [Qout/Qin](%)= 23.54
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.2091

ROUTE PIPE (0031)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.36	12.30	34.46	0.26	1.62
OUTFLOW: ID= 1 (0031)	14.59	0.36	12.40	34.46	0.26	1.62

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.275 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 15.327
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.294

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.62	0.35
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	60.45	24.82
over (min)	12.00	12.00
Storage Coeff. (min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

		TOTALS
PEAK FLOW (cms)=	0.10	0.02	0.124 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	51.12	18.32	39.30
TOTAL RAINFALL (mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT =	0.98	0.35	0.75

***** 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 (0017) | Area (ha)= 2.34
ID= 1 DT=12.0 min | Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	60.45	24.82
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

				TOTALS
PEAK FLOW	(cms)=	0.22	0.06	0.274 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.12	18.32	36.36
TOTAL RAINFALL	(mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT	=	0.98	0.35	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 (0019)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.275	12.00	15.33
+ ID2= 2 (0017):	2.34	0.274	12.00	36.36
ID = 3 (0019):	8.87	0.549	12.00	20.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	0.549	12.00	20.88
+ ID2= 2 (0018):	0.97	0.124	12.00	39.30
ID = 1 (0019):	9.84	0.673	12.00	22.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	0.673	12.00	22.69
+ ID2= 2 (0031):	14.59	0.360	12.40	34.46
ID = 3 (0032):	24.43	0.837	12.00	29.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	0.837	12.00	29.72
OUTFLOW: ID= 1 (0022)	24.430	0.361	12.90	29.71

PEAK FLOW REDUCTION [Qout/Qin](%)= 43.11
TIME SHIFT OF PEAK FLOW (min)= 54.00
MAXIMUM STORAGE USED (ha.m.)= 0.1600

CALIB
NASHYD (0023) | Area (ha)= 10.18 Curve Number (CN)= 74.0
ID= 1 DT=12.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 1.440

PEAK FLOW (cms)= 0.323 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 16.007
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.307

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0025) | Area (ha)= 2.59 Curve Number (CN)= 74.0
ID= 1 DT=12.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.099 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 15.706
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.301

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0027) | Area (ha)= 1.61 Curve Number (CN)= 74.0
ID= 1 DT=12.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.072 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 13.177
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.253

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0024) | Area (ha)= 6.71
ID= 1 DT=12.0 min | Total Imp(%)= 71.00 Dir. Conn.(%)= 71.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.76	1.95
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	60.45	24.82
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

				TOTALS
PEAK FLOW	(cms)=	0.80	0.11	0.908 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.12	18.32	41.61
TOTAL RAINFALL	(mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT	=	0.98	0.35	0.80

***** 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 (0062) ID= 1 DT=12.0 min | Area (ha)= 0.85 | Total Imp(%)= 28.00 | Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		60.45	24.82
over (min)		12.00	12.00
Storage Coeff. (min)=		1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.10
			TOTALS
PEAK FLOW (cms)=		0.04	0.03	0.074 (iii)
TIME TO PEAK (hrs)=		12.00	12.00	12.00
RUNOFF VOLUME (mm)=		51.12	18.32	27.50
TOTAL RAINFALL (mm)=		52.12	52.12	52.12
RUNOFF COEFFICIENT =		0.98	0.35	0.53

***** 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 (0028) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	0.323	12.00	16.01
+ ID2= 2 (0024):	6.71	0.908	12.00	41.61
ID = 3 (0028):	16.89	1.231	12.00	26.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	1.231	12.00	26.18
+ ID2= 2 (0025):	2.59	0.099	12.00	15.71
ID = 1 (0028):	19.48	1.330	12.00	24.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	1.330	12.00	24.79
+ ID2= 2 (0027):	1.61	0.072	12.00	13.18
ID = 3 (0028):	21.09	1.402	12.00	23.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	1.402	12.00	23.90
+ ID2= 2 (0062):	0.85	0.074	12.00	27.50
ID = 1 (0028):	21.94	1.476	12.00	24.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.361	12.90	29.71
+ ID2= 2 (0028):	21.94	1.476	12.00	24.04
ID = 3 (0029):	46.37	1.601	12.00	27.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030) IN= 2---> OUT= 1 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	1.601	12.00	27.04
OUTFLOW: ID= 1 (0030)	46.370	0.371	14.10	27.03

PEAK FLOW REDUCTION [Qout/Qin](%)= 23.16
TIME SHIFT OF PEAK FLOW (min)=126.00
MAXIMUM STORAGE USED (ha.m.)= 0.3759

CALIB NASHYD (0005) ID= 1 DT= 5.0 min | Area (ha)= 1.33 | Ia (mm)= 5.00 | U.H. Tp(hrs)= 0.13 | Curve Number (CN)= 74.0 | # of Linear Res.(N)= 3.00

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	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51

3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.066 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 16.121
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.309

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	0.51	6.200	1.02	12.200	10.67	18.20	0.76
0.400	0.51	6.400	1.02	12.400	6.60	18.40	0.76
0.600	0.51	6.600	1.02	12.600	4.83	18.60	0.76
0.800	0.51	6.800	1.02	12.800	4.57	18.80	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.200	0.51	7.200	1.02	13.200	2.79	19.20	0.76
1.400	0.51	7.400	1.02	13.400	2.79	19.40	0.76
1.600	0.51	7.600	1.02	13.600	2.79	19.60	0.76
1.800	0.51	7.800	1.02	13.800	2.79	19.80	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.200	0.51	8.200	1.52	14.200	1.52	20.20	0.51
2.400	0.51	8.400	1.52	14.400	1.52	20.40	0.51
2.600	0.51	8.600	1.52	14.600	1.52	20.60	0.51
2.800	0.51	8.800	1.52	14.800	1.52	20.80	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.200	0.51	9.200	1.52	15.200	1.52	21.20	0.51
3.400	0.51	9.400	1.52	15.400	1.52	21.40	0.51
3.600	0.51	9.600	1.52	15.600	1.52	21.60	0.51
3.800	0.51	9.800	1.52	15.800	1.52	21.80	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.200	1.02	10.200	3.05	16.200	1.02	22.20	0.51
4.400	1.02	10.400	3.05	16.400	1.02	22.40	0.51
4.600	1.02	10.600	3.05	16.600	1.02	22.60	0.51
4.800	1.02	10.800	3.05	16.800	1.02	22.80	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.200	1.02	11.200	4.06	17.200	1.02	23.20	0.51
5.400	1.02	11.400	5.84	17.400	1.02	23.40	0.51
5.600	1.02	11.600	13.21	17.600	1.02	23.60	0.51
5.800	1.02	11.800	28.96	17.800	1.02	23.80	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.00

Max.Eff.Inten.(mm/hr)=		60.45	24.82	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.23 (ii)	9.36 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.10	
				TOTALS
PEAK FLOW	(cms)=	0.16	0.03	0.185 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.02	18.26	39.22
TOTAL RAINFALL	(mm)=	52.02	52.02	52.02
RUNOFF COEFFICIENT	=	0.98	0.35	0.75

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=		60.45	24.82	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.23 (ii)	9.36 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.10	
				TOTALS
PEAK FLOW	(cms)=	0.17	0.14	0.315 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.02	18.26	27.43
TOTAL RAINFALL	(mm)=	52.02	52.02	52.02
RUNOFF COEFFICIENT	=	0.98	0.35	0.53

***** 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 (0007)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):		1.45	0.185	12.00	39.22
+ ID2= 2 (0005):		1.33	0.066	12.00	16.12
ID = 3 (0007):		2.78	0.251	12.00	28.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):		2.78	0.251	12.00	28.29
+ ID2= 2 (0063):		3.62	0.315	12.00	27.43
ID = 1 (0007):		6.40	0.566	12.00	27.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.3260	0.8017
	0.0790	0.1850	0.3960	0.9004
	0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.566	12.00	27.89
OUTFLOW: ID= 1 (0033)	6.400	0.043	13.00	27.79

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.54
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.0999

ROUTE PIPE (0034)		
IN= 2---> OUT= 1	Pipe Number	= 1.00
DT= 5.0 min	Diameter	(mm)=1650.00
	Length	(m)= 850.00
	Slope	(m/m)= 0.005
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<---- hydrograph ----> MAX DEPTH (m)	<-pipe / channel-> MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.04	13.00	27.79	0.09	0.82
OUTFLOW: ID= 1 (0034)	6.40	0.04	13.42	27.79	0.09	0.82

CALIB				
NASHYD (0035)	Area	(ha)= 8.03	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.22		

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.307 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 15.650
TOTAL RAINFALL (mm)= 52.019
RUNOFF COEFFICIENT = 0.301

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0037)	Area	(ha)= 10.64	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.24		

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 0.378 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 15.803
TOTAL RAINFALL (mm)= 52.019
RUNOFF COEFFICIENT = 0.304

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0038)	Area	(ha)= 2.11	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.26		

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.070 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 15.909
TOTAL RAINFALL (mm)= 52.019
RUNOFF COEFFICIENT = 0.306

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0036)	Area	(ha)= 17.98		
ID= 1 DT=12.0 min	Total Imp	(%)= 61.00	Dir. Conn.	(%)= 61.00

	IMPERVIOUS	PERVIOUS (i)	*TOTALS*
Surface Area (ha)=	10.97	7.01	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	60.45	24.82	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.23 (ii)	9.36 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.10	
PEAK FLOW (cms)=	1.84	0.39	2.230 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	51.02	18.26	38.24
TOTAL RAINFALL (mm)=	52.02	52.02	52.02
RUNOFF COEFFICIENT =	0.98	0.35	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.

CALIB				
STANDHYD (0039)	Area	(ha)= 1.21		
ID= 1 DT=12.0 min	Total Imp	(%)= 55.00	Dir. Conn.	(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)	*TOTALS*
Surface Area (ha)=	0.67	0.54	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	60.45	24.82	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.23 (ii)	9.36 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.10	
PEAK FLOW (cms)=	0.11	0.03	0.142 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	51.02	18.26	36.28
TOTAL RAINFALL (mm)=	52.02	52.02	52.02
RUNOFF COEFFICIENT =	0.98	0.35	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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.14	12.00	36.28
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.21	0.14	12.00	36.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0047)
ID= 1 DT=12.0 min

Area (ha)= 1.50
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.96	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	60.45	24.82
over (min)		12.00	12.00
Storage Coeff. (min)	=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak (min)	=	12.00	12.00
Unit Hyd. peak (cms)	=	0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	0.16 0.03 0.191 (iii)
TIME TO PEAK	(hrs)=	12.00 12.00 12.00
RUNOFF VOLUME	(mm)=	51.02 18.26 39.22
TOTAL RAINFALL	(mm)=	52.02 52.02 52.02
RUNOFF COEFFICIENT	=	0.98 0.35 0.75

***** 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.

DUHYD (0072)
Inlet Cap.=0.363
#of Inlets= 1
Total(cms)= 0.4

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.19	12.00	39.22
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.50	0.19	12.00	39.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0035):	8.03	0.307	12.00	15.65
+ ID2= 2 (0036):	17.98	2.230	12.00	38.24
ID = 3 (0040):	26.01	2.537	12.00	31.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	26.01	2.537	12.00	31.27
+ ID2= 2 (0037):	10.64	0.378	12.00	15.80
ID = 1 (0040):	36.65	2.915	12.00	26.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	36.65	2.915	12.00	26.78
+ ID2= 2 (0038):	2.11	0.070	12.00	15.91
ID = 3 (0040):	38.76	2.985	12.00	26.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0072 <ID= 2> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003				
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003				
ID1= 3 (0040):	38.76	2.985	12.00	26.19
+ ID2= 2 (0072):	0.00	0.000	0.00	0.00
ID = 1 (0040):	38.76	2.985	12.00	26.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0074 <ID= 2> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001				
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001				
ID1= 1 (0040):	38.76	2.985	12.00	26.19
+ ID2= 2 (0074):	0.00	0.000	0.00	0.00
ID = 3 (0040):	38.76	2.985	12.00	26.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0034):	6.40	0.042	13.42	27.79
+ ID2= 2 (0040):	38.76	2.985	12.00	26.19
ID = 3 (0041):	45.16	3.001	12.00	26.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0043)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	3.1150	0.9004
1.2740	0.5550	3.6250	1.1600
2.2650	0.7154	3.9640	1.3570

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0041)	45.160	3.001	12.00	26.53
OUTFLOW: ID= 1 (0043)	45.160	0.821	12.33	26.52

PEAK FLOW REDUCTION [Qout/Qin](%)= 27.37
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.3582

CALIB
NASHYD (0044)

Area (ha)= 3.28 Curve Number (CN)= 74.0

```
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.124 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  10.235
     TOTAL RAINFALL   (mm)=  52.019
     RUNOFF COEFFICIENT   =   0.197

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.082 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  15.734
     TOTAL RAINFALL   (mm)=  52.019
     RUNOFF COEFFICIENT   =   0.302

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    6.71         3.45
     Dep. Storage     (mm)=    1.00         1.50
     Average Slope     (%)=    2.00         2.00
     Length            (m)=   30.00        20.00
     Mannings n            =   0.013        0.250

     Max.Eff.Inten.(mm/hr)=   60.45        24.82
               over (min)     12.00        12.00
     Storage Coeff.  (min)=    1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=   12.00        12.00
     Unit Hyd. peak  (cms)=    0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=    1.13         0.19         1.317 (iii)
     TIME TO PEAK    (hrs)=   12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=   51.02        18.26        39.88
     TOTAL RAINFALL   (mm)=   52.02        52.02        52.02
     RUNOFF COEFFICIENT   =    0.98         0.35         0.77

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    0.86         0.41
     Dep. Storage     (mm)=    1.00         1.50
     Average Slope     (%)=    2.00         2.00
     Length            (m)=   30.00        20.00
     Mannings n            =   0.013        0.250

     Max.Eff.Inten.(mm/hr)=   60.45        24.82
               over (min)     12.00        12.00
     Storage Coeff.  (min)=    1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=   12.00        12.00
     Unit Hyd. peak  (cms)=    0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=    0.15         0.02         0.168 (iii)
     TIME TO PEAK    (hrs)=   12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=   51.02        18.26        40.53
     TOTAL RAINFALL   (mm)=   52.02        52.02        52.02
     RUNOFF COEFFICIENT   =    0.98         0.35         0.78

***** 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.

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--------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.27      0.17     12.00    40.53
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   1.27      0.17     12.00    40.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0070) |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    1.38         1.12
     Dep. Storage     (mm)=    1.00         1.50
     Average Slope     (%)=    2.00         2.00
     Length            (m)=   30.00        20.00
     Mannings n            =   0.013        0.250

     Max.Eff.Inten.(mm/hr)=   60.45        24.82
               over (min)     12.00        12.00
     Storage Coeff.  (min)=    1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=   12.00        12.00
     Unit Hyd. peak  (cms)=    0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=    0.23         0.06         0.293 (iii)
     TIME TO PEAK    (hrs)=   12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=   51.02        18.26        36.28
     TOTAL RAINFALL   (mm)=   52.02        52.02        52.02
     RUNOFF COEFFICIENT   =    0.98         0.35         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.

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--------------------
| DUHYD     (0071) |
| Inlet Cap.=0.550 |
| #of Inlets=    1 |
| Total(cms)=  0.6 |       AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.50      0.29     12.00    36.28
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   2.50      0.29     12.00    36.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28   0.124    12.00    10.24
        + ID2= 2 (0045):    10.16   1.317    12.00    39.88
          ================================================
          ID = 3 (0048):    13.44   1.441    12.00    32.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44   1.441    12.00    32.65
        + ID2= 2 (0046):     2.21   0.082    12.00    15.73
          ================================================
          ID = 1 (0048):    15.65   1.522    12.00    30.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65   1.522    12.00    30.26
        + ID2= 2 (0069):     1.27   0.168    12.00    40.53
          ================================================
          ID = 3 (0048):    16.92   1.690    12.00    31.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.92   1.690    12.00    31.03
        + ID2= 2 (0071):     2.50   0.293    12.00    36.28
          ================================================
          ID = 1 (0048):    19.42   1.983    12.00    31.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.42   1.983    12.00    31.70
        + ID2= 2 (0072):     1.50   0.191    12.00    39.22
          ================================================
          ID = 3 (0048):    20.92   2.174    12.00    32.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0049) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                        0.0000     0.0000     |   0.9630     0.3823
                        0.5430     0.1233     |   1.3030     0.6907
                        0.7650     0.2343     |   1.5860     1.0977

                                  AREA     QPEAK     TPEAK      R.V.
                                   (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0048)      20.920     2.174     12.00     32.24
     OUTFLOW: ID= 1 (0049)      20.920     0.700     12.20     32.24

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 32.19
                    TIME SHIFT OF PEAK FLOW          (min)= 12.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.2047

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| ROUTE PIPE (0050)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length        (m)= 467.00
-------------------      Slope      (m/m)=  0.006
                         Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE    VELOCITY     TRAV.TIME
         (m)     (cu.m.)       (cms)        (m/s)         min
        0.09    .201E+02         0.0         0.88          8.87
        0.17    .560E+02         0.2         1.37          5.68
        0.26    .101E+03         0.4         1.76          4.42
        0.35    .153E+03         0.7         2.09          3.72
        0.43    .210E+03         1.1         2.38          3.27
        0.52    .270E+03         1.5         2.64          2.95
        0.61    .334E+03         2.0         2.86          2.72
        0.69    .399E+03         2.6         3.06          2.55
        0.78    .466E+03         3.2         3.23          2.41
        0.87    .533E+03         3.9         3.38          2.31
        0.96    .599E+03         4.5         3.50          2.22
        1.04    .665E+03         5.1         3.60          2.16
        1.13    .728E+03         5.7         3.68          2.11
        1.22    .789E+03         6.3         3.74          2.08
        1.30    .846E+03         6.8         3.76          2.07
        1.39    .897E+03         7.2         3.76          2.07
        1.48    .943E+03         7.5         3.72          2.09
        1.56    .978E+03         7.6         3.63          2.15
        1.65    .999E+03         7.1         3.30          2.36

                                  <---- hydrograph ---->   <-pipe / channel->
                                 AREA    QPEAK    TPEAK    R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)    (hrs)    (mm)     (m)      (m/s)
     INFLOW : ID= 2 (0049)     20.92     0.70    12.20   32.24     0.35       2.10
     OUTFLOW: ID= 1 (0050)     20.92     0.70    12.20   32.24     0.35       2.10

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| CALIB            |
| NASHYD    (0054) |  Area     (ha)=   1.34   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |  Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.233

     PEAK FLOW       (cms)=   0.051 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  15.650
     TOTAL RAINFALL   (mm)=  52.019
     RUNOFF COEFFICIENT   =   0.301

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0056) |  Area     (ha)=   0.10   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |  Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.05

     Unit Hyd Qpeak  (cms)=   0.076

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=   1.301
     TOTAL RAINFALL   (mm)=  52.019
     RUNOFF COEFFICIENT   =   0.025

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0058) |  Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |  Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------  U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.080 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  15.949
     TOTAL RAINFALL   (mm)=  52.019
     RUNOFF COEFFICIENT   =   0.307

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0057) |  Area     (ha)=   0.47
|ID= 1 DT=12.0 min |  Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                                  IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=        0.33          0.14
     Dep. Storage      (mm)=        1.00          1.50
     Average Slope      (%)=        2.00          2.00
     Length             (m)=       30.00         20.00
     Mannings n             =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=       60.45         24.82
               over (min)         12.00         12.00
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     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.01          0.063 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      51.02        18.26          41.18
     TOTAL RAINFALL   (mm)=      52.02        52.02          52.02
     RUNOFF COEFFICIENT   =       0.98         0.35           0.79

***** 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.

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-------------------
| ADD HYD   (0073) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0057):      0.47   0.063    12.00     41.18
       + ID2= 2 (0058):      2.51   0.080    12.00     15.95
         ==========================================================
         ID = 3 (0073):      2.98   0.143    12.00     19.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| DUHYD     (0066) |
| Inlet Cap.=0.181 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |       AREA     QPEAK     TPEAK     R.V.
-------------------        (ha)      (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.98      0.14      12.00    19.93
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00       0.00     0.00
     MINOR SYS.(ID= 3):   2.98      0.14      12.00    19.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB             |
| STANDHYD  (0053)  |   Area    (ha)=   5.86
|ID= 1 DT=12.0 min  |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.28         2.58
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        24.82
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.55         0.14          0.694 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      51.02        18.26          36.60
     TOTAL RAINFALL   (mm)=      52.02        52.02          52.02
     RUNOFF COEFFICIENT   =       0.98         0.35           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.

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-------------------
| CALIB             |
| STANDHYD  (0055)  |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        24.82
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.11          0.226 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      51.02        18.26          26.45
     TOTAL RAINFALL   (mm)=      52.02        52.02          52.02
     RUNOFF COEFFICIENT   =       0.98         0.35           0.51

***** 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.

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| CALIB             |
| STANDHYD  (0065)  |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        24.82
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.11          0.226 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      51.02        18.26          26.45
     TOTAL RAINFALL   (mm)=      52.02        52.02          52.02
     RUNOFF COEFFICIENT   =       0.98         0.35           0.51

***** 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.

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-------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0053):      5.86   0.694    12.00     36.60
       + ID2= 2 (0054):      1.34   0.051    12.00     15.65
         ==========================================================
         ID = 3 (0051):      7.20   0.745    12.00     32.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0051):      7.20   0.745    12.00     32.70
       + ID2= 2 (0055):      2.71   0.226    12.00     26.45
         ==========================================================
         ID = 1 (0051):      9.91   0.971    12.00     30.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0051):	9.91	0.971	12.00	30.99
	+ ID2= 2 (0056):	0.10	0.001	12.00	1.30
	ID = 3 (0051):	10.01	0.972	12.00	30.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0051):	10.01	0.972	12.00	30.70
	+ ID2= 2 (0065):	2.71	0.226	12.00	26.45
	ID = 1 (0051):	12.72	1.198	12.00	29.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0051):	12.72	1.198	12.00	29.79
	+ ID2= 2 (0066):	2.98	0.143	12.00	19.93
	ID = 3 (0051):	15.70	1.341	12.00	27.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003

	ID1= 3 (0051):	15.70	1.341	12.00	27.92
	+ ID2= 2 (0069):	0.00	0.000	0.00	0.00
	ID = 1 (0051):	15.70	1.341	12.00	27.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0050):	20.92	0.700	12.20	32.24
	+ ID2= 2 (0051):	15.70	1.341	12.00	27.92
	ID = 3 (0060):	36.62	1.871	12.00	30.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	0.5100	0.3577
		0.2970	0.1233	0.6800	0.7154
		0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.620	1.871	12.00	30.39
OUTFLOW: ID= 1 (0061)	36.620	0.505	13.20	30.39

PEAK FLOW REDUCTION [Qout/Qin](%)= 26.98
TIME SHIFT OF PEAK FLOW (min)= 72.00
MAXIMUM STORAGE USED (ha.m.)= 0.3497

****
** SIMULATION NUMBER: 2 **
****

READ STORM | Ptotal= 62.43 mm

Filename: C:\Users\DMcBrayne\AppData\Local\Temp\122dfadb-b082-4939-8279-0906fc8de536\47b56346
Comments: FIVE YR SCS STORM WITH A TWELVE MINUTE

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	0.76	6.20	1.27	12.20	12.19	18.20	1.27
0.40	0.76	6.40	1.27	12.40	7.62	18.40	1.27
0.60	0.76	6.60	1.27	12.60	5.59	18.60	1.27
0.80	0.76	6.80	1.27	12.80	5.08	18.80	1.27
1.00	0.76	7.00	1.27	13.00	3.81	19.00	1.27
1.20	0.76	7.20	1.27	13.20	3.05	19.20	1.02
1.40	0.76	7.40	1.27	13.40	3.05	19.40	1.02
1.60	0.76	7.60	1.27	13.60	3.05	19.60	1.02
1.80	0.76	7.80	1.27	13.80	3.05	19.80	1.02
2.00	0.76	8.00	1.27	14.00	3.05	20.00	1.02
2.20	0.76	8.20	1.78	14.20	1.78	20.20	1.02
2.40	0.76	8.40	1.78	14.40	1.78	20.40	1.02
2.60	0.76	8.60	1.78	14.60	1.78	20.60	1.02
2.80	0.76	8.80	1.78	14.80	1.78	20.80	1.02
3.00	0.76	9.00	1.78	15.00	1.78	21.00	1.02
3.20	0.76	9.20	1.78	15.20	1.78	21.20	0.76
3.40	0.76	9.40	1.78	15.40	1.78	21.40	0.76
3.60	0.76	9.60	1.78	15.60	1.78	21.60	0.76
3.80	0.76	9.80	1.78	15.80	1.78	21.80	0.76
4.00	0.76	10.00	1.78	16.00	1.78	22.00	0.76
4.20	1.27	10.20	3.30	16.20	1.27	22.20	0.76
4.40	1.27	10.40	3.30	16.40	1.27	22.40	0.76
4.60	1.27	10.60	3.30	16.60	1.27	22.60	0.76
4.80	1.27	10.80	3.30	16.80	1.27	22.80	0.76
5.00	1.27	11.00	3.30	17.00	1.27	23.00	0.76
5.20	1.27	11.20	4.57	17.20	1.27	23.20	0.76
5.40	1.27	11.40	6.60	17.40	1.27	23.40	0.76
5.60	1.27	11.60	15.24	17.60	1.27	23.60	0.76
5.80	1.27	11.80	33.27	17.80	1.27	23.80	0.76
6.00	1.27	12.00	69.60	18.00	1.27	24.00	0.76

CALIB | NASHYD (0011) | ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 20.584
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.330

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0010) | ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.36	1.51	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.46	0.11	0.568 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	47.12
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.75

***** 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 (0012)	Area (ha)= 6.86	
ID= 1 DT=12.0 min	Total Imp(%)= 61.00	Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	213.85	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		69.60	32.00	
over (min)		12.00	12.00	
Storage Coeff. (min)=		3.78 (ii)	11.13 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.09	
				TOTALS
PEAK FLOW	(cms)=	0.79	0.18	0.971 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	47.12
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.75

***** 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 (0064)	Area (ha)= 2.95	
ID= 1 DT=12.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.74	2.21	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		69.60	32.00	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.14	0.16	0.306 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	33.90
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.54

***** 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 (0013)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0010):	3.87	0.568	12.00	47.12
	+ ID2= 2 (0011):	0.91	0.053	12.00	20.58
	ID = 3 (0013):	4.78	0.621	12.00	42.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0013):	4.78	0.621	12.00	42.06
	+ ID2= 2 (0012):	6.86	0.971	12.00	47.12
	ID = 1 (0013):	11.64	1.592	12.00	45.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0013):	11.64	1.592	12.00	45.04
	+ ID2= 2 (0064):	2.95	0.306	12.00	33.90
	ID = 3 (0013):	14.59	1.898	12.00	42.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.6510	0.4563
	0.1220	0.1110	0.8770	0.7650
	0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	1.898	12.00	42.79
OUTFLOW: ID= 1 (0021)	14.590	0.410	12.30	42.77

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.62
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.2511

ROUTE PIPE (0031)		
IN= 2---> OUT= 1	PIPE Number	= 1.00
DT= 5.0 min	Diameter	(mm)=1650.00
	Length	(m)= 500.00
	Slope	(m/m)= 0.005
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.41	12.30	42.77	0.28	1.67
OUTFLOW: ID= 1 (0031)	14.59	0.41	12.30	42.77	0.28	1.67

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| CALIB                |
| NASHYD    (0016)     |   Area     (ha)=   6.53   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------     U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   1.313

     PEAK FLOW       (cms)=   0.365 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  21.169
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.339

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB              |
| STANDHYD  (0018)   |   Area     (ha)=   0.97
|ID= 1 DT=12.0 min   |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.62         0.35
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
                  over (min)      12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.03       0.146 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72       48.21
     TOTAL RAINFALL   (mm)=      62.43        62.43       62.43
     RUNOFF COEFFICIENT   =       0.98         0.40        0.77

***** 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.

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| CALIB              |
| STANDHYD  (0017)   |   Area     (ha)=   2.34
|ID= 1 DT=12.0 min   |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
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                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.29         1.05
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
                  over (min)      12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.25         0.08       0.327 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72       44.91
     TOTAL RAINFALL   (mm)=      62.43        62.43       62.43
     RUNOFF COEFFICIENT   =       0.98         0.40        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.

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| ADD HYD   (0019)   |
|   1 +  2 =  3      |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
          ID1= 1 (0016):      6.53    0.365    12.00     21.17
        + ID2= 2 (0017):      2.34    0.327    12.00     44.91
          ================================================
          ID = 3 (0019):      8.87    0.691    12.00     27.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0019)   |
|   3 +  2 =  1      |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
          ID1= 3 (0019):      8.87    0.691    12.00     27.43
        + ID2= 2 (0018):      0.97    0.146    12.00     48.21
          ================================================
          ID = 1 (0019):      9.84    0.837    12.00     29.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0032)   |
|   1 +  2 =  3      |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)      (mm)
          ID1= 1 (0019):      9.84    0.837    12.00     29.48
        + ID2= 2 (0031):     14.59    0.410    12.30     42.77
          ================================================
          ID = 3 (0032):     24.43    1.068    12.00     37.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0022)   |
| IN= 2---> OUT= 1   |
| DT=  5.0 min       |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)    |    (cms)     (ha.m.)
                           0.0000     0.0000    |   0.6510      0.4564
                           0.1220     0.0863    |   0.8770      0.7894
                           0.3620     0.1603    |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0032)     24.430     1.068     12.00      37.42
     OUTFLOW: ID= 1 (0022)     24.430     0.401     13.10      37.41

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 37.53
                    TIME SHIFT OF PEAK FLOW          (min)= 66.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.2002

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD    (0023)   |   Area     (ha)=  10.18   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min   |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   0.432 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  22.108
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.354

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB              |
| NASHYD    (0025)   |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min   |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.132 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  21.692
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.347

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| CALIB                |
| NASHYD    (0027)     |   Area     (ha)=   1.61   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------     U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.095 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  18.199
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.292

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB                |
| STANDHYD  (0024)     |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min     |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.76         1.95
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.92         0.14          1.065 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72          50.79
     TOTAL RAINFALL   (mm)=      62.43        62.43          62.43
     RUNOFF COEFFICIENT   =       0.98         0.40           0.81

***** 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.

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-------------------
| CALIB                |
| STANDHYD  (0062)     |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min     |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.61
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.05          0.091 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72          35.00
     TOTAL RAINFALL   (mm)=      62.43        62.43          62.43
     RUNOFF COEFFICIENT   =       0.98         0.40           0.56

***** 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.

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| ADD HYD   (0028)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0023):     10.18    0.432    12.00    22.11
        + ID2= 2 (0024):      6.71    1.065    12.00    50.79
          ================================================
          ID = 3 (0028):     16.89    1.497    12.00    33.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0028)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0028):     16.89    1.497    12.00    33.50
        + ID2= 2 (0025):      2.59    0.132    12.00    21.69
          ================================================
          ID = 1 (0028):     19.48    1.629    12.00    31.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0028)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0028):     19.48    1.629    12.00    31.93
        + ID2= 2 (0027):      1.61    0.095    12.00    18.20
          ================================================
          ID = 3 (0028):     21.09    1.724    12.00    30.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0028)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0028):     21.09    1.724    12.00    30.88
        + ID2= 2 (0062):      0.85    0.091    12.00    35.00
          ================================================
          ID = 1 (0028):     21.94    1.815    12.00    31.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0029)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0022):     24.43    0.401    13.10    37.41
        + ID2= 2 (0028):     21.94    1.815    12.00    31.04
          ================================================
          ID = 3 (0029):     46.37    2.010    12.00    34.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0030)  |
| IN= 2---> OUT= 1  |
| DT=  5.0 min      |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)     |    (cms)     (ha.m.)
                         0.0000     0.0000     |   1.3030      1.3940
                         0.4380     0.4440     |   1.5000      1.8008
                         0.9910     1.0000     |   1.7560      2.3930

                              AREA     QPEAK     TPEAK        R.V.
                              (ha)     (cms)     (hrs)        (mm)
     INFLOW : ID= 2 (0029)   46.370     2.010     12.00       34.41
     OUTFLOW: ID= 1 (0030)   46.370     0.453     14.20       34.41

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.54
                    TIME SHIFT OF PEAK FLOW       (min)=132.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.4592

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-------------------
| CALIB                |
| NASHYD    (0005)     |   Area     (ha)=   1.33   Curve Number   (CN)= 74.0
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|ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.088 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 22.266
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.357

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004) | Area (ha)= 1.45
ID= 1 DT=12.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	0.76	6.200	1.27	12.200	12.19	18.20	1.27
0.400	0.76	6.400	1.27	12.400	7.62	18.40	1.27
0.600	0.76	6.600	1.27	12.600	5.59	18.60	1.27
0.800	0.76	6.800	1.27	12.800	5.08	18.80	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.200	0.76	7.200	1.27	13.200	3.05	19.20	1.02
1.400	0.76	7.400	1.27	13.400	3.05	19.40	1.02
1.600	0.76	7.600	1.27	13.600	3.05	19.60	1.02
1.800	0.76	7.800	1.27	13.800	3.05	19.80	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.200	0.76	8.200	1.78	14.200	1.78	20.20	1.02
2.400	0.76	8.400	1.78	14.400	1.78	20.40	1.02
2.600	0.76	8.600	1.78	14.600	1.78	20.60	1.02
2.800	0.76	8.800	1.78	14.800	1.78	20.80	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.200	0.76	9.200	1.78	15.200	1.78	21.20	0.76
3.400	0.76	9.400	1.78	15.400	1.78	21.40	0.76
3.600	0.76	9.600	1.78	15.600	1.78	21.60	0.76
3.800	0.76	9.800	1.78	15.800	1.78	21.80	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.200	1.27	10.200	3.30	16.200	1.27	22.20	0.76
4.400	1.27	10.400	3.30	16.400	1.27	22.40	0.76
4.600	1.27	10.600	3.30	16.600	1.27	22.60	0.76
4.800	1.27	10.800	3.30	16.800	1.27	22.80	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.200	1.27	11.200	4.57	17.200	1.27	23.20	0.76
5.400	1.27	11.400	6.60	17.400	1.27	23.40	0.76
5.600	1.27	11.600	15.24	17.600	1.27	23.60	0.76
5.800	1.27	11.800	33.27	17.800	1.27	23.80	0.76
6.000	1.27	12.000	69.59	18.000	1.27	24.00	0.00

				TOTALS
Max.Eff.Inten.(mm/hr)=		69.59	32.00	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
PEAK FLOW	(cms)=	0.18	0.04	0.218 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.28	24.62	48.08
TOTAL RAINFALL	(mm)=	62.28	62.28	62.28
RUNOFF COEFFICIENT	=	0.98	0.40	0.77

***** 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 (0063) | Area (ha)= 3.62
ID= 1 DT=12.0 min | Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00

Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	69.59	32.00	
over (min)		12.00	12.00	
Storage Coeff. (min)	=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak (min)	=	12.00	12.00	
Unit Hyd. peak (cms)	=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.19	0.389 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.28	24.62	34.89
TOTAL RAINFALL	(mm)=	62.28	62.28	62.28
RUNOFF COEFFICIENT	=	0.98	0.40	0.56

***** 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 (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.218	12.00	48.08
+ ID2= 2 (0005):	1.33	0.088	12.00	22.27
ID = 3 (0007):	2.78	0.306	12.00	35.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.306	12.00	35.87
+ ID2= 2 (0063):	3.62	0.389	12.00	34.89
ID = 1 (0007):	6.40	0.694	12.00	35.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.694	12.00	35.42
OUTFLOW: ID= 1 (0033)	6.400	0.052	13.00	35.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.52
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1223

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.05	13.00	35.32	0.10	0.85
OUTFLOW: ID= 1 (0034)	6.40	0.05	13.33	35.32	0.10	0.85

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.409 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 21.600
TOTAL RAINFALL (mm)= 62.281
RUNOFF COEFFICIENT = 0.347

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 0.505 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 21.811
TOTAL RAINFALL (mm)= 62.281
RUNOFF COEFFICIENT = 0.350

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.093 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 21.957
TOTAL RAINFALL (mm)= 62.281
RUNOFF COEFFICIENT = 0.353

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	10.97	7.01
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	69.59	32.00
over (min)		12.00	12.00
Storage Coeff. (min)	=	1.16 (ii)	8.51 (ii)

```
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.12         0.52          2.639 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      61.28        24.62         46.98
     TOTAL RAINFALL   (mm)=      62.28        62.28         62.28
     RUNOFF COEFFICIENT   =       0.98         0.40          0.75

***** 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  (0039)|   Area    (ha)=   1.21
|ID= 1 DT=12.0 min|   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.67         0.54
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     69.59        32.00
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.13         0.04          0.169 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=     61.28        24.62         44.78
     TOTAL RAINFALL   (mm)=     62.28        62.28         62.28
     RUNOFF COEFFICIENT   =      0.98         0.40          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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0074)|
| Inlet Cap.=0.169|
| #of Inlets=    1|
| Total(cms)=  0.2|
-------------------          AREA     QPEAK     TPEAK     R.V.
                              (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):      1.21      0.17     12.00    44.78
     ================================================================
     MAJOR SYS.(ID= 2):      0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):      1.21      0.17     12.00    44.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD  (0047)|   Area    (ha)=   1.50
|ID= 1 DT=12.0 min|   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.96         0.54
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     69.59        32.00
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.19         0.04          0.226 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=     61.28        24.62         48.08
     TOTAL RAINFALL   (mm)=     62.28        62.28         62.28
     RUNOFF COEFFICIENT   =      0.98         0.40          0.77

***** 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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0072)|
| Inlet Cap.=0.363|
| #of Inlets=    1|
| Total(cms)=  0.4|
-------------------          AREA     QPEAK     TPEAK     R.V.
                              (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):      1.50      0.23     12.00    48.08
     ================================================================
     MAJOR SYS.(ID= 2):      0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):      1.50      0.23     12.00    48.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)|
|   1 +  2 =  3   |          AREA     QPEAK     TPEAK      R.V.
-------------------           (ha)     (cms)     (hrs)      (mm)
          ID1= 1 (0035):      8.03     0.409     12.00     21.60
        + ID2= 2 (0036):     17.98     2.639     12.00     46.98
          ================================================================
          ID = 3 (0040):     26.01     3.047     12.00     39.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)|
|   3 +  2 =  1   |          AREA     QPEAK     TPEAK      R.V.
-------------------           (ha)     (cms)     (hrs)      (mm)
          ID1= 3 (0040):     26.01     3.047     12.00     39.15
        + ID2= 2 (0037):     10.64     0.505     12.00     21.81
          ================================================================
          ID = 1 (0040):     36.65     3.552     12.00     34.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)|
|   1 +  2 =  3   |          AREA     QPEAK     TPEAK      R.V.
-------------------           (ha)     (cms)     (hrs)      (mm)
          ID1= 1 (0040):     36.65     3.552     12.00     34.11
        + ID2= 2 (0038):      2.11     0.093     12.00     21.96
          ================================================================
          ID = 3 (0040):     38.76     3.645     12.00     33.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)|
|   3 +  2 =  1   |          AREA     QPEAK     TPEAK      R.V.
-------------------           (ha)     (cms)     (hrs)      (mm)
*** W A R N I N G :  HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0040):     38.76     3.645     12.00     33.45
        + ID2= 2 (0072):      0.00     0.000      0.00      0.00
          ================================================================
          ID = 1 (0040):     38.76     3.645     12.00     33.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)|
|   1 +  2 =  3   |          AREA     QPEAK     TPEAK      R.V.
-------------------           (ha)     (cms)     (hrs)      (mm)
```

```
*** W A R N I N G :  HYDROGRAPH 0074 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
        ID1= 1 (0040):    38.76   3.645    12.00    33.45
      + ID2= 2 (0074):     0.00   0.000     0.00     0.00
        ==================================================
        ID = 3 (0040):    38.76   3.645    12.00    33.45

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0034):	6.40	0.052	13.33	35.32
+ ID2= 2 (0040):	38.76	3.645	12.00	33.45
ID = 3 (0041):	45.16	3.665	12.00	33.86

```
    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

RESERVOIR (0043)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	3.1150	0.9004
	1.2740	0.5550	3.6250	1.1600
	2.2650	0.7154	3.9640	1.3570

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0041)	45.160	3.665	12.00	33.86
OUTFLOW: ID= 1 (0043)	45.160	1.008	12.33	33.85

```
                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 27.51
                TIME SHIFT OF PEAK FLOW       (min)= 20.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.4399
```

CALIB				
NASHYD (0044)	Area	(ha)= 3.28	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.10		

```
    Unit Hyd Qpeak  (cms)=   1.253

    PEAK FLOW       (cms)=   0.163 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  14.127
    TOTAL RAINFALL   (mm)=  62.281
    RUNOFF COEFFICIENT   =   0.227

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB				
NASHYD (0046)	Area	(ha)= 2.21	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.23		

```
    Unit Hyd Qpeak  (cms)=   0.367

    PEAK FLOW       (cms)=   0.109 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  21.715
    TOTAL RAINFALL   (mm)=  62.281
    RUNOFF COEFFICIENT   =   0.349

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB				
STANDHYD (0045)	Area	(ha)= 10.16		
ID= 1 DT=12.0 min	Total Imp	(%)= 66.00	Dir. Conn.	(%)= 66.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	6.71	3.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	69.59	32.00
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11
			TOTALS
PEAK FLOW	(cms)=	1.30	0.26	1.552 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.28	24.62	48.82
TOTAL RAINFALL	(mm)=	62.28	62.28	62.28
RUNOFF COEFFICIENT	=	0.98	0.40	0.78

```
***** 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 (0059)	Area	(ha)= 1.27		
ID= 1 DT=12.0 min	Total Imp	(%)= 68.00	Dir. Conn.	(%)= 68.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.86	0.41
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	69.59	32.00
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11
			TOTALS
PEAK FLOW	(cms)=	0.17	0.03	0.197 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.28	24.62	49.55
TOTAL RAINFALL	(mm)=	62.28	62.28	62.28
RUNOFF COEFFICIENT	=	0.98	0.40	0.80

```
***** 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.
```

DUHYD (0069)					
Inlet Cap.=0.320					
#of Inlets= 1					
Total(cms)= 0.3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
TOTAL HYD.(ID= 1):	1.27	0.20	12.00	49.55	
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00	
MINOR SYS.(ID= 3):	1.27	0.20	12.00	49.55	

```
    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

CALIB				
STANDHYD (0070)	Area	(ha)= 2.50		
ID= 1 DT=12.0 min	Total Imp	(%)= 55.00	Dir. Conn.	(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.38	1.12
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	69.59	32.00
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)

```
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.08          0.349 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      61.28        24.62         44.78
     TOTAL RAINFALL   (mm)=      62.28        62.28         62.28
     RUNOFF COEFFICIENT   =       0.98         0.40          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.

--------------------------------------------------------------------------------
--------------------
| DUHYD     (0071) |
| Inlet Cap.=0.550 |
| #of Inlets=    1 |
| Total(cms)=  0.6 |       AREA     QPEAK     TPEAK    R.V.
--------------------       (ha)      (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.50       0.35     12.00   44.78
     ==================================================
     MAJOR SYS.(ID= 2):   0.00       0.00      0.00    0.00
     MINOR SYS.(ID= 3):   2.50       0.35     12.00   44.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28    0.163    12.00    14.13
        + ID2= 2 (0045):    10.16    1.552    12.00    48.82
          ================================================
          ID = 3 (0048):    13.44    1.715    12.00    40.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   3 +  2 =   1   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44    1.715    12.00    40.35
        + ID2= 2 (0046):     2.21    0.109    12.00    21.72
          ================================================
          ID = 1 (0048):    15.65    1.823    12.00    37.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65    1.823    12.00    37.72
        + ID2= 2 (0069):     1.27    0.197    12.00    49.55
          ================================================
          ID = 3 (0048):    16.92    2.020    12.00    38.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   3 +  2 =   1   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.92    2.020    12.00    38.61
        + ID2= 2 (0071):     2.50    0.349    12.00    44.78
          ================================================
          ID = 1 (0048):    19.42    2.369    12.00    39.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.42    2.369    12.00    39.40
        + ID2= 2 (0072):     1.50    0.226    12.00    48.08
          ================================================
          ID = 3 (0048):    20.92    2.595    12.00    40.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0049) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |       OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------        (cms)     (ha.m.)    |   (cms)     (ha.m.)
                            0.0000     0.0000    |  0.9630     0.3823
                            0.5430     0.1233    |  1.3030     0.6907
                            0.7650     0.2343    |  1.5860     1.0977

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0048)      20.920     2.595     12.00      40.02
     OUTFLOW: ID= 1 (0049)      20.920     0.779     12.20      40.02

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 30.04
                TIME SHIFT OF PEAK FLOW          (min)= 12.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.2476

--------------------------------------------------------------------------------
--------------------
| ROUTE PIPE (0050)|     PIPE Number      =    1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 467.00
--------------------     Slope       (m/m)=  0.006
                         Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)     (cu.m.)       (cms)         (m/s)        min
        0.09    .201E+02         0.0          0.88         8.87
        0.17    .560E+02         0.2          1.37         5.68
        0.26    .101E+03         0.4          1.76         4.42
        0.35    .153E+03         0.7          2.09         3.72
        0.43    .210E+03         1.1          2.38         3.27
        0.52    .270E+03         1.5          2.64         2.95
        0.61    .334E+03         2.0          2.86         2.72
        0.69    .399E+03         2.6          3.06         2.55
        0.78    .466E+03         3.2          3.23         2.41
        0.87    .533E+03         3.9          3.38         2.31
        0.96    .599E+03         4.5          3.50         2.22
        1.04    .665E+03         5.1          3.60         2.16
        1.13    .728E+03         5.7          3.68         2.11
        1.22    .789E+03         6.3          3.74         2.08
        1.30    .846E+03         6.8          3.76         2.07
        1.39    .897E+03         7.2          3.76         2.07
        1.48    .943E+03         7.5          3.72         2.09
        1.56    .978E+03         7.6          3.63         2.15
        1.65    .999E+03         7.1          3.30         2.36
                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0049)    20.92     0.78   12.20  40.02      0.37      2.16
     OUTFLOW: ID= 1 (0050)    20.92     0.78   12.20  40.02      0.37      2.16

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0054) |  Area     (ha)=   1.34   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |  Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.233

     PEAK FLOW       (cms)=   0.068 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  21.600
     TOTAL RAINFALL   (mm)=  62.281
     RUNOFF COEFFICIENT   =   0.347

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
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| NASHYD    (0056) |   Area     (ha)=   0.10   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.05

     Unit Hyd Qpeak  (cms)=   0.076

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=   1.926
     TOTAL RAINFALL   (mm)=  62.281
     RUNOFF COEFFICIENT   =   0.031

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0058)  |   Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.107 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  22.013
     TOTAL RAINFALL   (mm)=  62.281
     RUNOFF COEFFICIENT   =   0.353

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0057)  |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min  |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    0.33          0.14
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=   30.00         20.00
     Mannings n            =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=   69.59         32.00
               over (min)     12.00         12.00
     Storage Coeff.  (min)=    1.16 (ii)     8.51 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=    0.06          0.01      0.074 (iii)
     TIME TO PEAK    (hrs)=   12.00         12.00       12.00
     RUNOFF VOLUME    (mm)=   61.28         24.62       50.27
     TOTAL RAINFALL   (mm)=   62.28         62.28       62.28
     RUNOFF COEFFICIENT   =    0.98          0.40        0.81

***** 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   (0073)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0057):     0.47   0.074    12.00    50.27
        + ID2= 2 (0058):     2.51   0.107    12.00    22.01
          ==========================================
          ID = 3 (0073):     2.98   0.181    12.00    26.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| DUHYD     (0066)  |
| Inlet Cap.=0.181  |
| #of Inlets=    1  |
| Total(cms)=  0.2  |       AREA     QPEAK     TPEAK     R.V.
-------------------          (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.98      0.18     12.00    26.47
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   2.98      0.18     12.00    26.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0053)  |   Area     (ha)=   5.86
|ID= 1 DT=12.0 min  |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
-------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    3.28          2.58
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=   30.00         20.00
     Mannings n            =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=   69.59         32.00
               over (min)     12.00         12.00
     Storage Coeff.  (min)=    1.16 (ii)     8.51 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=    0.63          0.19      0.825 (iii)
     TIME TO PEAK    (hrs)=   12.00         12.00       12.00
     RUNOFF VOLUME    (mm)=   61.28         24.62       45.15
     TOTAL RAINFALL   (mm)=   62.28         62.28       62.28
     RUNOFF COEFFICIENT   =    0.98          0.40        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.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0055)  |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    0.68          2.03
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=   30.00         20.00
     Mannings n            =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=   69.59         32.00
               over (min)     12.00         12.00
     Storage Coeff.  (min)=    1.16 (ii)     8.51 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=    0.13          0.15      0.281 (iii)
     TIME TO PEAK    (hrs)=   12.00         12.00       12.00
     RUNOFF VOLUME    (mm)=   61.28         24.62       33.79
     TOTAL RAINFALL   (mm)=   62.28         62.28       62.28
     RUNOFF COEFFICIENT   =    0.98          0.40        0.54

***** 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  (0065)  |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    0.68          2.03
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=   30.00         20.00
     Mannings n            =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=   69.59         32.00
               over (min)     12.00         12.00
```

```
     Storage Coeff.  (min)=       1.16 (ii)     8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.13          0.15          0.281 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=      61.28         24.62         33.79
     TOTAL RAINFALL   (mm)=      62.28         62.28         62.28
     RUNOFF COEFFICIENT   =       0.98          0.40          0.54

***** 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.

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-------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0053):      5.86   0.825    12.00    45.15
       + ID2= 2 (0054):      1.34   0.068    12.00    21.60
         ================================================
         ID = 3 (0051):      7.20   0.893    12.00    40.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0051):      7.20   0.893    12.00    40.77
       + ID2= 2 (0055):      2.71   0.281    12.00    33.79
         ================================================
         ID = 1 (0051):      9.91   1.174    12.00    38.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0051):      9.91   1.174    12.00    38.86
       + ID2= 2 (0056):      0.10   0.001    12.00     1.93
         ================================================
         ID = 3 (0051):     10.01   1.175    12.00    38.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0051):     10.01   1.175    12.00    38.49
       + ID2= 2 (0065):      2.71   0.281    12.00    33.79
         ================================================
         ID = 1 (0051):     12.72   1.456    12.00    37.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0051):     12.72   1.456    12.00    37.49
       + ID2= 2 (0066):      2.98   0.181    12.00    26.47
         ================================================
         ID = 3 (0051):     15.70   1.637    12.00    35.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
         ID1= 3 (0051):     15.70   1.637    12.00    35.40
       + ID2= 2 (0069):      0.00   0.000     0.00     0.00
         ================================================
         ID = 1 (0051):     15.70   1.637    12.00    35.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0060) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0050):     20.92   0.777    12.20    40.02
       + ID2= 2 (0051):     15.70   1.637    12.00    35.40
         ================================================
         ID = 3 (0060):     36.62   2.243    12.00    38.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0061) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |       OUTFLOW    STORAGE     |   OUTFLOW    STORAGE
-------------------          (cms)     (ha.m.)     |     (cms)     (ha.m.)
                           0.0000      0.0000     |    0.5100      0.3577
                           0.2970      0.1233     |    0.6800      0.7154
                           0.4250      0.2220     |    0.7930      1.1964

                                AREA      QPEAK      TPEAK        R.V.
                                (ha)      (cms)      (hrs)        (mm)
     INFLOW : ID= 2 (0060)     36.620      2.243      12.00       38.05
     OUTFLOW: ID= 1 (0061)     36.620      0.547      13.30       38.04

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 24.38
                   TIME SHIFT OF PEAK FLOW          (min)= 78.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=  0.4354

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  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************


-------------------
|    READ STORM    |    Filename: C:\Users\DMcBrayne\AppD
|                  |              ata\Local\Temp\
|                  |              122dfadb-b082-4939-8279-0906fc8de536\0d4474df
| Ptotal= 82.45 mm |    Comments: TEN YR SCS STORM 24HR TWELVE MIN TIME ST
-------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	0.76	6.20	1.78	12.20	92.20	18.20	1.78
0.40	0.76	6.40	1.78	12.40	16.00	18.40	1.78
0.60	0.76	6.60	1.78	12.60	10.16	18.60	1.78
0.80	0.76	6.80	1.78	12.80	7.37	18.80	1.78
1.00	0.76	7.00	1.78	13.00	6.86	19.00	1.78
1.20	0.76	7.20	1.78	13.20	4.83	19.20	1.78
1.40	0.76	7.40	1.78	13.40	4.06	19.40	1.27
1.60	0.76	7.60	1.78	13.60	4.06	19.60	1.27
1.80	0.76	7.80	1.78	13.80	4.06	19.80	1.27
2.00	0.76	8.00	1.78	14.00	4.06	20.00	1.27
2.20	0.76	8.20	1.78	14.20	4.06	20.20	1.27
2.40	0.76	8.40	2.54	14.40	2.54	20.40	1.27
2.60	0.76	8.60	2.54	14.60	2.54	20.60	1.27
2.80	0.76	8.80	2.54	14.80	2.54	20.80	1.27
3.00	0.76	9.00	2.54	15.00	2.54	21.00	1.27
3.20	0.76	9.20	2.54	15.20	2.54	21.20	1.27
3.40	0.76	9.40	2.54	15.40	2.54	21.40	0.76
3.60	0.76	9.60	2.54	15.60	2.54	21.60	0.76
3.80	0.76	9.80	2.54	15.80	2.54	21.80	0.76
4.00	0.76	10.00	2.54	16.00	2.54	22.00	0.76
4.20	0.76	10.20	2.54	16.20	2.54	22.20	0.76
4.40	1.78	10.40	4.57	16.40	1.78	22.40	0.76
4.60	1.78	10.60	4.57	16.60	1.78	22.60	0.76
4.80	1.78	10.80	4.57	16.80	1.78	22.80	0.76
5.00	1.78	11.00	4.57	17.00	1.78	23.00	0.76
5.20	1.78	11.20	4.57	17.20	1.78	23.20	0.76
5.40	1.78	11.40	6.10	17.40	1.78	23.40	0.76

5.60	1.78	11.60	8.89	17.60	1.78	23.60	0.76
5.80	1.78	11.80	20.07	17.80	1.78	23.80	0.76
6.00	1.78	12.00	44.20	18.00	1.78	24.00	0.76

CALIB
NASHYD (0011)
ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.087 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 32.935
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.399

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0010)
ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.36	1.51
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	50.35
over (min)		12.00	12.00
Storage Coeff. (min)=		1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.60 0.18 0.789 (iii)
TIME TO PEAK	(hrs)=	12.20 12.20 12.20
RUNOFF VOLUME	(mm)=	81.45 38.50 64.70
TOTAL RAINFALL	(mm)=	82.45 82.45 82.45
RUNOFF COEFFICIENT	=	0.99 0.47 0.78

***** 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 (0012)
ID= 1 DT=12.0 min

Area (ha)= 6.86
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.18	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	213.85	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	50.35
over (min)		12.00	12.00
Storage Coeff. (min)=		3.38 (ii)	9.51 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	1.06 0.30 1.357 (iii)
TIME TO PEAK	(hrs)=	12.20 12.20 12.20
RUNOFF VOLUME	(mm)=	81.45 38.50 64.70
TOTAL RAINFALL	(mm)=	82.45 82.45 82.45
RUNOFF COEFFICIENT	=	0.99 0.47 0.78

***** 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 (0064)
ID= 1 DT=12.0 min

Area (ha)= 2.95
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.74	2.21
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	50.35
over (min)		12.00	12.00
Storage Coeff. (min)=		1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.19 0.27 0.460 (iii)
TIME TO PEAK	(hrs)=	12.20 12.20 12.20
RUNOFF VOLUME	(mm)=	81.45 38.50 49.24
TOTAL RAINFALL	(mm)=	82.45 82.45 82.45
RUNOFF COEFFICIENT	=	0.99 0.47 0.60

***** 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 (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.789	12.20	64.70
+ ID2= 2 (0011):	0.91	0.087	12.20	32.93
ID = 3 (0013):	4.78	0.876	12.20	58.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	0.876	12.20	58.65
+ ID2= 2 (0012):	6.86	1.357	12.20	64.70
ID = 1 (0013):	11.64	2.233	12.20	62.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	2.233	12.20	62.21
+ ID2= 2 (0064):	2.95	0.460	12.20	49.24
ID = 3 (0013):	14.59	2.693	12.20	59.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
INFLOW : ID= 2 (0013)     14.590      2.693     12.20      59.59
OUTFLOW: ID= 1 (0021)     14.590      0.534     12.50      59.57

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 19.82
                TIME SHIFT OF PEAK FLOW          (min)= 18.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.3563
```

ROUTE PIPE (0031)	PIPE Number = 1.00
IN= 2---> OUT= 1	Diameter (mm)=1650.00
DT= 5.0 min	Length (m)= 500.00
	Slope (m/m)= 0.005
	Manning n = 0.013

<TRAVEL TIME TABLE>

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.53	12.50	59.57	0.32	1.80
OUTFLOW: ID= 1 (0031)	14.59	0.53	12.60	59.57	0.32	1.80

CALIB NASHYD (0016) ID= 1 DT=12.0 min	Area (ha)= 6.53	Curve Number (CN)= 74.0
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.19	

```
Unit Hyd Qpeak  (cms)=   1.313

PEAK FLOW       (cms)=   0.595 (i)
TIME TO PEAK    (hrs)=  12.200
RUNOFF VOLUME    (mm)=  33.872
TOTAL RAINFALL   (mm)=  82.446
RUNOFF COEFFICIENT   =   0.411

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB STANDHYD (0018) ID= 1 DT=12.0 min	Area (ha)= 0.97	Total Imp(%)= 64.00	Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	92.20	50.35
over (min)		12.00	12.00
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.16 (iii)
TIME TO PEAK	(hrs)=	12.20
RUNOFF VOLUME	(mm)=	81.45
TOTAL RAINFALL	(mm)=	82.45
RUNOFF COEFFICIENT	=	0.99

```
***** 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 (0017) ID= 1 DT=12.0 min	Area (ha)= 2.34	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	92.20	50.35
over (min)		12.00	12.00
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.459 (iii)
TIME TO PEAK	(hrs)=	12.20
RUNOFF VOLUME	(mm)=	62.12
TOTAL RAINFALL	(mm)=	82.45
RUNOFF COEFFICIENT	=	0.75

```
***** 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 (0019) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.595	12.20	33.87
+ ID2= 2 (0017):	2.34	0.459	12.20	62.12
ID = 3 (0019):	8.87	1.053	12.20	41.32

```
NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0019) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	1.053	12.20	41.32
+ ID2= 2 (0018):	0.97	0.202	12.20	65.98
ID = 1 (0019):	9.84	1.255	12.20	43.75

```
NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0032) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	1.255	12.20	43.75
+ ID2= 2 (0031):	14.59	0.533	12.60	59.57
ID = 3 (0032):	24.43	1.619	12.20	53.20

```
NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

RESERVOIR (0022) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)

0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	1.619	12.20	53.20
OUTFLOW: ID= 1 (0022)	24.430	0.506	13.60	53.19

PEAK FLOW REDUCTION [Qout/Qin](%)= 31.25
TIME SHIFT OF PEAK FLOW (min)= 84.00
MAXIMUM STORAGE USED (ha.m.)= 0.3078

CALIB
NASHYD (0023)
ID= 1 DT=12.0 min

Area (ha)= 10.18 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 1.440

PEAK FLOW (cms)= 0.711 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 35.373
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0025)
ID= 1 DT=12.0 min

Area (ha)= 2.59 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.216 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 34.708
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.421

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0027)
ID= 1 DT=12.0 min

Area (ha)= 1.61 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.155 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 29.119
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.353

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0024)
ID= 1 DT=12.0 min

Area (ha)= 6.71
Total Imp(%)= 71.00 Dir. Conn.(%)= 71.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.76	1.95
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	50.35
over (min)		12.00	12.00
Storage Coeff. (min)=		1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	1.22 0.24 1.458 (iii)
TIME TO PEAK	(hrs)=	12.20 12.20 12.20
RUNOFF VOLUME	(mm)=	81.45 38.50 68.99
TOTAL RAINFALL	(mm)=	82.45 82.45 82.45
RUNOFF COEFFICIENT	=	0.99 0.47 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 (0062)
ID= 1 DT=12.0 min

Area (ha)= 0.85
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	50.35
over (min)		12.00	12.00
Storage Coeff. (min)=		1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.06 0.07 0.136 (iii)
TIME TO PEAK	(hrs)=	12.20 12.20 12.20
RUNOFF VOLUME	(mm)=	81.45 38.50 50.52
TOTAL RAINFALL	(mm)=	82.45 82.45 82.45
RUNOFF COEFFICIENT	=	0.99 0.47 0.61

***** 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 (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	0.711	12.20	35.37
+ ID2= 2 (0024):	6.71	1.458	12.20	68.99
ID = 3 (0028):	16.89	2.169	12.20	48.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	2.169	12.20	48.73
+ ID2= 2 (0025):	2.59	0.216	12.20	34.71
ID = 1 (0028):	19.48	2.385	12.20	46.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	2.385	12.20	46.86
+ ID2= 2 (0027):	1.61	0.155	12.20	29.12
ID = 3 (0028):	21.09	2.539	12.20	45.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0028):	21.09	2.539	12.20	45.51
	+ ID2= 2 (0062):	0.85	0.136	12.20	50.52
	ID = 1 (0028):	21.94	2.675	12.20	45.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0022):	24.43	0.506	13.60	53.19
	+ ID2= 2 (0028):	21.94	2.675	12.20	45.70
	ID = 3 (0029):	46.37	3.039	12.20	49.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)	OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1	(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min	0.0000	0.0000	1.3030	1.3940
	0.4380	0.4440	1.5000	1.8008
	0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	3.039	12.20	49.67
OUTFLOW: ID= 1 (0030)	46.370	0.636	14.40	49.66

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.92
TIME SHIFT OF PEAK FLOW (min)=132.00
MAXIMUM STORAGE USED (ha.m.)= 0.6428

CALIB				
NASHYD (0005)	Area	(ha)= 1.33	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)= 0.13			

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	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.133 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 35.626
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.432

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0004)	Area	(ha)= 1.45	
ID= 1 DT=12.0 min	Total Imp(%)= 64.00	Dir. Conn.(%)= 64.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	0.76	6.200	1.78	12.200	92.20	18.20	1.78
0.400	0.76	6.400	1.78	12.400	16.00	18.40	1.78
0.600	0.76	6.600	1.78	12.600	10.16	18.60	1.78
0.800	0.76	6.800	1.78	12.800	7.37	18.80	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.200	0.76	7.200	1.78	13.200	4.83	19.20	1.78
1.400	0.76	7.400	1.78	13.400	4.06	19.40	1.27
1.600	0.76	7.600	1.78	13.600	4.06	19.60	1.27
1.800	0.76	7.800	1.78	13.800	4.06	19.80	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.200	0.76	8.200	1.78	14.200	4.06	20.20	1.27
2.400	0.76	8.400	2.54	14.400	2.54	20.40	1.27
2.600	0.76	8.600	2.54	14.600	2.54	20.60	1.27
2.800	0.76	8.800	2.54	14.800	2.54	20.80	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27

3.200	0.76	9.200	2.54	15.200	2.54	21.20	1.27
3.400	0.76	9.400	2.54	15.400	2.54	21.40	0.76
3.600	0.76	9.600	2.54	15.600	2.54	21.60	0.76
3.800	0.76	9.800	2.54	15.800	2.54	21.80	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.200	0.76	10.200	2.54	16.200	2.54	22.20	0.76
4.400	1.78	10.400	4.57	16.400	1.78	22.40	0.76
4.600	1.78	10.600	4.57	16.600	1.78	22.60	0.76
4.800	1.78	10.800	4.57	16.800	1.78	22.80	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.200	1.78	11.200	4.57	17.200	1.78	23.20	0.76
5.400	1.78	11.400	6.10	17.400	1.78	23.40	0.76
5.600	1.78	11.600	8.89	17.600	1.78	23.60	0.76
5.800	1.78	11.800	20.07	17.800	1.78	23.80	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.00

Max.Eff.Inten.(mm/hr)=	92.20	50.35	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.04 (ii)	7.17 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.24	0.06	0.302 (iii)
TIME TO PEAK (hrs)=	12.20	12.20	12.20
RUNOFF VOLUME (mm)=	81.29	38.39	65.85
TOTAL RAINFALL (mm)=	82.29	82.29	82.29
RUNOFF COEFFICIENT =	0.99	0.47	0.80

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=		1.01	2.61
Dep. Storage (mm)=		1.00	1.50
Average Slope (%)=		2.00	2.00
Length (m)=		30.00	20.00
Mannings n =		0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	50.35
over (min)		12.00	12.00
Storage Coeff. (min)=		1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12
			TOTALS
PEAK FLOW (cms)=		0.26	0.32	0.579 (iii)
TIME TO PEAK (hrs)=		12.20	12.20	12.20
RUNOFF VOLUME (mm)=		81.29	38.39	50.40
TOTAL RAINFALL (mm)=		82.29	82.29	82.29
RUNOFF COEFFICIENT =		0.99	0.47	0.61

***** 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 (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.302	12.20	65.85
+ ID2= 2 (0005):	1.33	0.133	12.25	35.63
ID = 3 (0007):	2.78	0.404	12.17	51.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1				
ID1= 3 (0007):	2.78	0.404	12.17	51.29
+ ID2= 2 (0063):	3.62	0.579	12.20	50.40
ID = 1 (0007):	6.40	0.928	12.17	50.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.928	12.17	50.71
OUTFLOW: ID= 1 (0033)	6.400	0.076	13.17	50.62

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.15
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1771

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.08	13.17	50.62	0.12	0.92
OUTFLOW: ID= 1 (0034)	6.40	0.07	13.42	50.61	0.12	0.92

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.668 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 34.604
TOTAL RAINFALL (mm)= 82.294
RUNOFF COEFFICIENT = 0.420

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)

Area (ha)= 10.64 Curve Number (CN)= 74.0

```
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

     Unit Hyd Qpeak  (cms)=   1.693

     PEAK FLOW       (cms)=   0.827 (i)
     TIME TO PEAK    (hrs)=  12.200
     RUNOFF VOLUME    (mm)=  34.942
     TOTAL RAINFALL   (mm)=  82.294
     RUNOFF COEFFICIENT   =   0.425

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0038) |   Area     (ha)=   2.11   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.153 (i)
     TIME TO PEAK    (hrs)=  12.200
     RUNOFF VOLUME    (mm)=  35.176
     TOTAL RAINFALL   (mm)=  82.294
     RUNOFF COEFFICIENT   =   0.427

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0036) |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=   10.97          7.01
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=  30.00         20.00
     Mannings n            =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=   92.20         50.35
               over (min)     12.00         12.00
     Storage Coeff.  (min)=    1.04 (ii)     7.17 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=    2.81          0.86          3.668 (iii)
     TIME TO PEAK    (hrs)=   12.20         12.20          12.20
     RUNOFF VOLUME    (mm)=   81.29         38.39          64.56
     TOTAL RAINFALL   (mm)=   82.29         82.29          82.29
     RUNOFF COEFFICIENT   =    0.99          0.47           0.78

***** 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  (0039) |   Area     (ha)=   1.21
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    0.67          0.54
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=  30.00         20.00
     Mannings n            =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=   92.20         50.35
               over (min)     12.00         12.00
     Storage Coeff.  (min)=    1.04 (ii)     7.17 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=    0.17          0.07          0.237 (iii)
     TIME TO PEAK    (hrs)=   12.20         12.20          12.20
     RUNOFF VOLUME    (mm)=   81.29         38.39          61.98
     TOTAL RAINFALL   (mm)=   82.29         82.29          82.29
     RUNOFF COEFFICIENT   =    0.99          0.47           0.75

***** 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.

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--------------------
| DUHYD     (0074) |
| Inlet Cap.=0.169 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |       AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.21      0.24     12.20    61.98
     ================================================
     MAJOR SYS.(ID= 2):   0.08      0.07     12.20    61.98
     MINOR SYS.(ID= 3):   1.13      0.17     12.20    61.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0047) |   Area     (ha)=   1.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    0.96          0.54
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=  30.00         20.00
     Mannings n            =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=   92.20         50.35
               over (min)     12.00         12.00
     Storage Coeff.  (min)=    1.04 (ii)     7.17 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=    0.25          0.07          0.312 (iii)
     TIME TO PEAK    (hrs)=   12.20         12.20          12.20
     RUNOFF VOLUME    (mm)=   81.29         38.39          65.85
     TOTAL RAINFALL   (mm)=   82.29         82.29          82.29
     RUNOFF COEFFICIENT   =    0.99          0.47           0.80

***** 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.

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--------------------
| DUHYD     (0072) |
| Inlet Cap.=0.363 |
| #of Inlets=    1 |
| Total(cms)=  0.4 |       AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.50      0.31     12.20    65.85
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   1.50      0.31     12.20    65.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------        (ha)     (cms)    (hrs)      (mm)
          ID1= 1 (0035):     8.03    0.668    12.20     34.60
        + ID2= 2 (0036):    17.98    3.668    12.20     64.56
          ==========================================================
          ID = 3 (0040):    26.01    4.336    12.20     55.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0040) |
|  3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0040):    26.01   4.336    12.20    55.31
        + ID2= 2 (0037):    10.64   0.827    12.20    34.94
          ================================================
          ID = 1 (0040):    36.65   5.163    12.20    49.40

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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-------------------
| ADD HYD   (0040) |
|  1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0040):    36.65   5.163    12.20    49.40
        + ID2= 2 (0038):     2.11   0.153    12.20    35.18
          ================================================
          ID = 3 (0040):    38.76   5.316    12.20    48.62

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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-------------------
| ADD HYD   (0040) |
|  3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0040):    38.76   5.316    12.20    48.62
        + ID2= 2 (0072):     0.00   0.000     0.00     0.00
          ================================================
          ID = 1 (0040):    38.76   5.316    12.20    48.62

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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-------------------
| ADD HYD   (0040) |
|  1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0040):    38.76   5.316    12.20    48.62
        + ID2= 2 (0074):     0.08   0.068    12.20    61.98
          ================================================
          ID = 3 (0040):    38.84   5.384    12.20    48.65

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| ADD HYD   (0041) |
|  1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0034):     6.40   0.075    13.42    50.61
        + ID2= 2 (0040):    38.84   5.384    12.20    48.65
          ================================================
          ID = 3 (0041):    45.24   4.896    12.17    48.85

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

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-------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |       OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------         (cms)     (ha.m.)    |     (cms)     (ha.m.)
                          0.0000      0.0000     |    3.1150      0.9004
                          1.2740      0.5550     |    3.6250      1.1600
                          2.2650      0.7154     |    3.9640      1.3570

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (0041)     45.239     4.896     12.17      48.85
    OUTFLOW: ID= 1 (0043)     45.239     1.709     12.50      48.85

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 34.90
                TIME SHIFT OF PEAK FLOW       (min)= 20.00
                MAXIMUM  STORAGE   USED      (ha.m.)=  0.6256
```

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-------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.264 (i)
     TIME TO PEAK    (hrs)=  12.200
     RUNOFF VOLUME    (mm)=  22.632
     TOTAL RAINFALL   (mm)=  82.294
     RUNOFF COEFFICIENT   =   0.275

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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-------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.178 (i)
     TIME TO PEAK    (hrs)=  12.200
     RUNOFF VOLUME    (mm)=  34.789
     TOTAL RAINFALL   (mm)=  82.294
     RUNOFF COEFFICIENT   =   0.423

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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-------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71          3.45
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      92.20         50.35
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.04 (ii)     7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.72          0.42          2.140 (iii)
     TIME TO PEAK    (hrs)=      12.20         12.20         12.20
     RUNOFF VOLUME    (mm)=      81.29         38.39         66.71
     TOTAL RAINFALL   (mm)=      82.29         82.29         82.29
     RUNOFF COEFFICIENT   =       0.99          0.47          0.81

***** 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.
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-------------------
| CALIB            |
| STANDHYD  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.86          0.41
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      92.20         50.35
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.04 (ii)     7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.22          0.05          0.271 (iii)
```

```
     TIME TO PEAK    (hrs)=      12.20        12.20          12.20
     RUNOFF VOLUME    (mm)=      81.29        38.39          67.56
     TOTAL RAINFALL   (mm)=      82.29        82.29          82.29
     RUNOFF COEFFICIENT   =       0.99         0.47           0.82

***** 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.

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--------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK    R.V.
--------------------       (ha)      (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):    1.27      0.27     12.20   67.56
     ==========================================================
     MAJOR SYS.(ID= 2):    0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):    1.27      0.27     12.20   67.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0070) |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.38         1.12
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     92.20        50.35
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.35         0.14          0.490 (iii)
     TIME TO PEAK    (hrs)=     12.20        12.20          12.20
     RUNOFF VOLUME    (mm)=     81.29        38.39          61.98
     TOTAL RAINFALL   (mm)=     82.29        82.29          82.29
     RUNOFF COEFFICIENT   =      0.99         0.47           0.75

***** 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.

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--------------------
| DUHYD     (0071) |
| Inlet Cap.=0.550 |
| #of Inlets=    1 |
| Total(cms)=  0.6 |       AREA     QPEAK     TPEAK    R.V.
--------------------       (ha)      (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):    2.50      0.49     12.20   61.98
     ==========================================================
     MAJOR SYS.(ID= 2):    0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):    2.50      0.49     12.20   61.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0044):      3.28    0.264    12.20    22.63
       + ID2= 2 (0045):     10.16    2.140    12.20    66.71
         ==========================================================
         ID = 3 (0048):     13.44    2.404    12.20    55.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0048):      13.44    2.404    12.20    55.95
       + ID2= 2 (0046):      2.21    0.178    12.20    34.79
         ==========================================================
         ID = 1 (0048):      15.65    2.582    12.20    52.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0048):      15.65    2.582    12.20    52.96
       + ID2= 2 (0069):      1.27    0.271    12.20    67.56
         ==========================================================
         ID = 3 (0048):      16.92    2.853    12.20    54.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0048):      16.92    2.853    12.20    54.06
       + ID2= 2 (0071):      2.50    0.490    12.20    61.98
         ==========================================================
         ID = 1 (0048):      19.42    3.343    12.20    55.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0048):      19.42    3.343    12.20    55.08
       + ID2= 2 (0072):      1.50    0.312    12.20    65.85
         ==========================================================
         ID = 3 (0048):      20.92    3.655    12.20    55.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0049) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000     |  0.9630     0.3823
                         0.5430     0.1233     |  1.3030     0.6907
                         0.7650     0.2343     |  1.5860     1.0977

                                  AREA     QPEAK     TPEAK        R.V.
                                  (ha)     (cms)     (hrs)        (mm)
     INFLOW : ID= 2 (0048)      20.920     3.655     12.20       55.85
     OUTFLOW: ID= 1 (0049)      20.920     0.937     12.40       55.85

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 25.64
                  TIME SHIFT OF PEAK FLOW          (min)= 12.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.3637

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--------------------
| ROUTE PIPE (0050)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter     (mm)=1650.00
| DT=  5.0 min     |     Length        (m)= 467.00
--------------------     Slope       (m/m)=  0.006
                         Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME    FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (cu.m.)      (cms)         (m/s)         min
       0.09     .201E+02       0.0          0.88          8.87
       0.17     .560E+02       0.2          1.37          5.68
       0.26     .101E+03       0.4          1.76          4.42
```

0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.92	0.94	12.40	55.85	0.40	2.27
OUTFLOW: ID= 1 (0050)	20.92	0.94	12.50	55.85	0.40	2.27

CALIB NASHYD (0054) ID= 1 DT=12.0 min | Area (ha)= 1.34 | Curve Number (CN)= 74.0 | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.112 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 34.604
TOTAL RAINFALL (mm)= 82.294
RUNOFF COEFFICIENT = 0.420

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0056) ID= 1 DT=12.0 min | Area (ha)= 0.10 | Curve Number (CN)= 74.0 | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 3.085
TOTAL RAINFALL (mm)= 82.294
RUNOFF COEFFICIENT = 0.037

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0058) ID= 1 DT=12.0 min | Area (ha)= 2.51 | Curve Number (CN)= 74.0 | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.175 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 35.266
TOTAL RAINFALL (mm)= 82.294
RUNOFF COEFFICIENT = 0.429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0057) ID= 1 DT=12.0 min | Area (ha)= 0.47 | Total Imp(%)= 70.00 | Dir. Conn.(%)= 70.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)	0.33	0.14
Dep. Storage (mm)	1.00	1.50
Average Slope (%)	2.00	2.00
Length (m)	30.00	20.00
Mannings n	0.013	0.250
Max.Eff.Inten.(mm/hr)	92.20	50.35
over (min)	12.00	12.00
Storage Coeff. (min)	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)	12.00	12.00
Unit Hyd. peak (cms)	0.14	0.12

		TOTALS
PEAK FLOW (cms)	0.08	0.102 (iii)
TIME TO PEAK (hrs)	12.20	12.20
RUNOFF VOLUME (mm)	81.29	38.39	68.42
TOTAL RAINFALL (mm)	82.29	82.29	82.29
RUNOFF COEFFICIENT =	0.99	0.47	0.83

***** 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 (0073) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.102	12.20	68.42
+ ID2= 2 (0058):	2.51	0.175	12.20	35.27
ID = 3 (0073):	2.98	0.277	12.20	40.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066) Inlet Cap.=0.181 #of Inlets= 1 Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.28	12.20	40.49
MAJOR SYS.(ID= 2):	0.17	0.10	12.20	40.49
MINOR SYS.(ID= 3):	2.81	0.18	12.20	40.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0053) ID= 1 DT=12.0 min | Area (ha)= 5.86 | Total Imp(%)= 56.00 | Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)	3.28	2.58
Dep. Storage (mm)	1.00	1.50
Average Slope (%)	2.00	2.00
Length (m)	30.00	20.00
Mannings n	0.013	0.250
Max.Eff.Inten.(mm/hr)	92.20	50.35
over (min)	12.00	12.00
Storage Coeff. (min)	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)	12.00	12.00
Unit Hyd. peak (cms)	0.14	0.12

		TOTALS
PEAK FLOW (cms)	0.84	0.32	1.156 (iii)
TIME TO PEAK (hrs)	12.20	12.20	12.20
RUNOFF VOLUME (mm)	81.29	38.39	62.42
TOTAL RAINFALL (mm)	82.29	82.29	82.29
RUNOFF COEFFICIENT =	0.99	0.47	0.76

***** 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 (0055) ID= 1 DT=12.0 min | Area (ha)= 2.71 | Total Imp(%)= 25.00 | Dir. Conn.(%)= 25.00

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                              IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       0.68         2.03
     Dep. Storage      (mm)=       1.00         1.50
     Average Slope      (%)=       2.00         2.00
     Length             (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.25          0.422 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20          12.20
     RUNOFF VOLUME    (mm)=      81.29        38.39          49.12
     TOTAL RAINFALL   (mm)=      82.29        82.29          82.29
     RUNOFF COEFFICIENT   =       0.99         0.47           0.60

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0065) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       0.68         2.03
     Dep. Storage      (mm)=       1.00         1.50
     Average Slope      (%)=       2.00         2.00
     Length             (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.25          0.422 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20          12.20
     RUNOFF VOLUME    (mm)=      81.29        38.39          49.12
     TOTAL RAINFALL   (mm)=      82.29        82.29          82.29
     RUNOFF COEFFICIENT   =       0.99         0.47           0.60

***** 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.

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| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0053):      5.86    1.156    12.20    62.42
       + ID2= 2 (0054):      1.34    0.112    12.20    34.60
         ================================================
         ID = 3 (0051):      7.20    1.268    12.20    57.24

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0051):      7.20    1.268    12.20    57.24
       + ID2= 2 (0055):      2.71    0.422    12.20    49.12
         ================================================
         ID = 1 (0051):      9.91    1.690    12.20    55.02

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0051):      9.91    1.690    12.20    55.02
       + ID2= 2 (0056):      0.10    0.001    12.20     3.08
         ================================================
         ID = 3 (0051):     10.01    1.691    12.20    54.50

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0051):     10.01    1.691    12.20    54.50
       + ID2= 2 (0065):      2.71    0.422    12.20    49.12
         ================================================
         ID = 1 (0051):     12.72    2.114    12.20    53.35

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0051):     12.72    2.114    12.20    53.35
       + ID2= 2 (0066):      2.81    0.181    12.20    40.49
         ================================================
         ID = 3 (0051):     15.53    2.295    12.20    51.03

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
         ID1= 3 (0051):     15.53    2.295    12.20    51.03
       + ID2= 2 (0069):      0.00    0.000     0.00     0.00
         ================================================
         ID = 1 (0051):     15.53    2.295    12.20    51.03

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0060) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0050):     20.92    0.938    12.50    55.85
       + ID2= 2 (0051):     15.53    2.295    12.20    51.03
         ================================================
         ID = 3 (0060):     36.45    3.029    12.20    53.80

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0061) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |   OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |    (cms)     (ha.m.)
                         0.0000     0.0000    |   0.5100      0.3577
                         0.2970     0.1233    |   0.6800      0.7154
                         0.4250     0.2220    |   0.7930      1.1964

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (0060)     36.446     3.029     12.20      53.80
    OUTFLOW: ID= 1 (0061)     36.446     0.652     14.00      53.80

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 21.52
          TIME SHIFT OF PEAK FLOW         (min)=108.00
```

MAXIMUM STORAGE USED (ha.m.)= 0.6566

****
** SIMULATION NUMBER: 4 **
****

READ STORM | Filename: C:\Users\DMcBrayne\AppData\Local\Temp\122dfadb-b082-4939-8279-0906fc8de536\05dd739c
Ptotal= 95.96 mm | Comments: TWENTYFIVE YR SCS STORM WITH A TWELVE MI

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	1.02	6.20	2.03	12.20	18.80	18.20	2.03
0.40	1.02	6.40	2.03	12.40	11.68	18.40	2.03
0.60	1.02	6.60	2.03	12.60	8.38	18.60	2.03
0.80	1.02	6.80	2.03	12.80	8.13	18.80	2.03
1.00	1.02	7.00	2.03	13.00	5.59	19.00	2.03
1.20	1.02	7.20	2.03	13.20	4.83	19.20	1.52
1.40	1.02	7.40	2.03	13.40	4.83	19.40	1.52
1.60	1.02	7.60	2.03	13.60	4.83	19.60	1.52
1.80	1.02	7.80	2.03	13.80	4.83	19.80	1.52
2.00	1.02	8.00	2.03	14.00	4.83	20.00	1.52
2.20	1.02	8.20	2.79	14.20	2.79	20.20	1.52
2.40	1.02	8.40	2.79	14.40	2.79	20.40	1.52
2.60	1.02	8.60	2.79	14.60	2.79	20.60	1.52
2.80	1.02	8.80	2.79	14.80	2.79	20.80	1.52
3.00	1.02	9.00	2.79	15.00	2.79	21.00	1.52
3.20	1.02	9.20	2.79	15.20	2.79	21.20	1.02
3.40	1.02	9.40	2.79	15.40	2.79	21.40	1.02
3.60	1.02	9.60	2.79	15.60	2.79	21.60	1.02
3.80	1.02	9.80	2.79	15.80	2.79	21.80	1.02
4.00	1.02	10.00	2.79	16.00	2.79	22.00	1.02
4.20	2.03	10.20	5.08	16.20	2.03	22.20	1.02
4.40	2.03	10.40	5.08	16.40	2.03	22.40	1.02
4.60	2.03	10.60	5.08	16.60	2.03	22.60	1.02
4.80	2.03	10.80	5.08	16.80	2.03	22.80	1.02
5.00	2.03	11.00	5.08	17.00	2.03	23.00	1.02
5.20	2.03	11.20	7.11	17.20	2.03	23.20	1.02
5.40	2.03	11.40	10.41	17.40	2.03	23.40	1.02
5.60	2.03	11.60	23.37	17.60	2.03	23.60	1.02
5.80	2.03	11.80	51.56	17.80	2.03	23.80	1.02
6.00	2.03	12.00	107.44	18.00	2.03	24.00	1.02

CALIB NASHYD (0011) ID= 1 DT=12.0 min | Area (ha)= 0.91 Curve Number (CN)= 74.0 | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.111 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 42.025
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.438

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0010) ID= 1 DT=12.0 min | Area (ha)= 3.87 | Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.36	1.51
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	107.44	63.42
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.70	0.24	0.943 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	76.87
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	0.80

***** 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 (0012) ID= 1 DT=12.0 min | Area (ha)= 6.86 | Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.18	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	213.85	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	107.44	63.42
over	(min)	12.00	12.00
Storage Coeff.	(min)=	3.18 (ii)	8.77 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	1.23	0.39	1.624 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	76.87
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	0.80

***** 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 (0064) ID= 1 DT=12.0 min | Area (ha)= 2.95 | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.74	2.21
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	107.44	63.42
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.22	0.35	0.569 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	60.17
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	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 (0013) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.943	12.00	76.87
+ ID2= 2 (0011):	0.91	0.111	12.00	42.03

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          ================================================
          ID = 3 (0013):     4.78   1.053    12.00    70.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0013) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0013):     4.78   1.053    12.00    70.23
        + ID2= 2 (0012):     6.86   1.624    12.00    76.87
          ================================================
          ID = 1 (0013):    11.64   2.677    12.00    74.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0013) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):    11.64   2.677    12.00    74.14
        + ID2= 2 (0064):     2.95   0.569    12.00    60.17
          ================================================
          ID = 3 (0013):    14.59   3.247    12.00    71.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0021) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |          OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------           (cms)     (ha.m.)    |   (cms)     (ha.m.)
                               0.0000    0.0000     |  0.6510     0.4563
                               0.1220    0.1110     |  0.8770     0.7650
                               0.3620    0.2096     |  0.0000     0.0000

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0013)      14.590      3.247     12.00      71.32
     OUTFLOW: ID= 1 (0021)      14.590      0.617     12.30      71.30

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 19.01
                    TIME SHIFT OF PEAK FLOW          (min)= 18.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.4278

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--------------------
| ROUTE PIPE (0031)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 500.00
--------------------     Slope       (m/m)=  0.005
                         Manning n        =  0.013

     <---------- TRAVEL TIME TABLE ---------->
       DEPTH      VOLUME     FLOW RATE    VELOCITY    TRAV.TIME
        (m)      (cu.m.)       (cms)        (m/s)        min
       0.09     .216E+02        0.0         0.80        10.40
       0.17     .600E+02        0.1         1.25         6.67
       0.26     .108E+03        0.3         1.61         5.18
       0.35     .164E+03        0.6         1.91         4.36
       0.43     .225E+03        1.0         2.18         3.83
       0.52     .290E+03        1.4         2.41         3.46
       0.61     .358E+03        1.9         2.61         3.19
       0.69     .428E+03        2.4         2.79         2.99
       0.78     .499E+03        2.9         2.95         2.83
       0.87     .570E+03        3.5         3.08         2.70
       0.96     .642E+03        4.1         3.20         2.61
       1.04     .712E+03        4.7         3.29         2.53
       1.13     .780E+03        5.2         3.36         2.48
       1.22     .844E+03        5.8         3.41         2.44
       1.30     .905E+03        6.2         3.44         2.43
       1.39     .961E+03        6.6         3.43         2.43
       1.48     .101E+04        6.9         3.40         2.45
       1.56     .105E+04        6.9         3.31         2.52
       1.65     .107E+04        6.5         3.02         2.76
                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)    (hrs)   (mm)      (m)       (m/s)
     INFLOW : ID= 2 (0021)   14.59     0.62    12.30  71.30      0.34      1.90
     OUTFLOW: ID= 1 (0031)   14.59     0.62    12.30  71.30      0.34      1.90
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| CALIB            |
| NASHYD    (0016) |   Area     (ha)=   6.53   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   1.313

     PEAK FLOW       (cms)=   0.760 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  43.221
     TOTAL RAINFALL   (mm)=  95.961
     RUNOFF COEFFICIENT    =   0.450

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0018) |   Area     (ha)=   0.97
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        0.62          0.35
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      107.44         63.42
               over (min)         12.00         12.00
     Storage Coeff.  (min)=        0.98 (ii)     6.57 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.19          0.06      0.240 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00      12.00
     RUNOFF VOLUME    (mm)=       94.96         48.57      78.26
     TOTAL RAINFALL   (mm)=       95.96         95.96      95.96
     RUNOFF COEFFICIENT   =        0.99          0.51       0.82

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0017) |   Area     (ha)=   2.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        1.29          1.05
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      107.44         63.42
               over (min)         12.00         12.00
     Storage Coeff.  (min)=        0.98 (ii)     6.57 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.38          0.17      0.550 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00      12.00
     RUNOFF VOLUME    (mm)=       94.96         48.57      74.08
     TOTAL RAINFALL   (mm)=       95.96         95.96      95.96
     RUNOFF COEFFICIENT   =        0.99          0.51       0.77

***** 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.

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| ADD HYD   (0019) |
|  1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0016):     6.53   0.760    12.00    43.22
       + ID2= 2 (0017):     2.34   0.550    12.00    74.08
         ================================================
         ID = 3 (0019):     8.87   1.310    12.00    51.36

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0019) |
|  3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0019):     8.87   1.310    12.00    51.36
       + ID2= 2 (0018):     0.97   0.240    12.00    78.26
         ================================================
         ID = 1 (0019):     9.84   1.550    12.00    54.01

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0032) |
|  1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0019):     9.84   1.550    12.00    54.01
       + ID2= 2 (0031):    14.59   0.618    12.30    71.30
         ================================================
         ID = 3 (0032):    24.43   1.978    12.00    64.34

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0022) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)     |   (cms)     (ha.m.)
                          0.0000     0.0000     |   0.6510     0.4564
                          0.1220     0.0863     |   0.8770     0.7894
                          0.3620     0.1603     |   0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (0032)    24.430     1.978     12.00      64.34
    OUTFLOW: ID= 1 (0022)    24.430     0.579     13.50      64.33

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 29.26
                  TIME SHIFT OF PEAK FLOW          (min)= 90.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.3823

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| CALIB            |
| NASHYD    (0023) |   Area     (ha)=  10.18   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

    Unit Hyd Qpeak  (cms)=   1.440

    PEAK FLOW       (cms)=   0.911 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  45.136
    TOTAL RAINFALL   (mm)=  95.961
    RUNOFF COEFFICIENT   =   0.470

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0025) |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

    Unit Hyd Qpeak  (cms)=   0.450

    PEAK FLOW       (cms)=   0.276 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  44.289
    TOTAL RAINFALL   (mm)=  95.961
    RUNOFF COEFFICIENT   =   0.462

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0027) |   Area     (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13

    Unit Hyd Qpeak  (cms)=   0.473

    PEAK FLOW       (cms)=   0.197 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  37.157
    TOTAL RAINFALL   (mm)=  95.961
    RUNOFF COEFFICIENT   =   0.387

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0024) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
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                                IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=          4.76          1.95
    Dep. Storage     (mm)=          1.00          1.50
    Average Slope     (%)=          2.00          2.00
    Length            (m)=         30.00         20.00
    Mannings n           =         0.013         0.250

    Max.Eff.Inten.(mm/hr)=        107.44         63.42
              over (min)          12.00         12.00
    Storage Coeff.  (min)=          0.98 (ii)     6.57 (ii)
    Unit Hyd. Tpeak (min)=         12.00         12.00
    Unit Hyd. peak  (cms)=          0.14          0.12
                                                          *TOTALS*
    PEAK FLOW       (cms)=          1.42          0.31     1.729 (iii)
    TIME TO PEAK    (hrs)=         12.00         12.00     12.00
    RUNOFF VOLUME    (mm)=         94.96         48.57     81.51
    TOTAL RAINFALL   (mm)=         95.96         95.96     95.96
    RUNOFF COEFFICIENT   =          0.99          0.51      0.85

***** 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.

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| CALIB            |
| STANDHYD  (0062) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
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                                IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=          0.24          0.61
    Dep. Storage     (mm)=          1.00          1.50
    Average Slope     (%)=          2.00          2.00
    Length            (m)=         30.00         20.00
    Mannings n           =         0.013         0.250

    Max.Eff.Inten.(mm/hr)=        107.44         63.42
              over (min)          12.00         12.00
    Storage Coeff.  (min)=          0.98 (ii)     6.57 (ii)
    Unit Hyd. Tpeak (min)=         12.00         12.00
    Unit Hyd. peak  (cms)=          0.14          0.12
                                                          *TOTALS*
    PEAK FLOW       (cms)=          0.07          0.10     0.168 (iii)
    TIME TO PEAK    (hrs)=         12.00         12.00     12.00
    RUNOFF VOLUME    (mm)=         94.96         48.57     61.56
    TOTAL RAINFALL   (mm)=         95.96         95.96     95.96
    RUNOFF COEFFICIENT   =          0.99          0.51      0.64

***** 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 (0028)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0023):	10.18	0.911	12.00	45.14
	+ ID2= 2 (0024):	6.71	1.729	12.00	81.51
	ID = 3 (0028):	16.89	2.640	12.00	59.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
3 + 1 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0028):	16.89	2.640	12.00	59.59
	+ ID2= 2 (0025):	2.59	0.276	12.00	44.29
	ID = 1 (0028):	19.48	2.915	12.00	57.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0028):	19.48	2.915	12.00	57.55
	+ ID2= 2 (0027):	1.61	0.197	12.00	37.16
	ID = 3 (0028):	21.09	3.112	12.00	56.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0028):	21.09	3.112	12.00	56.00
	+ ID2= 2 (0062):	0.85	0.168	12.00	61.56
	ID = 1 (0028):	21.94	3.280	12.00	56.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0022):	24.43	0.579	13.50	64.33
	+ ID2= 2 (0028):	21.94	3.280	12.00	56.21
	ID = 3 (0029):	46.37	3.677	12.00	60.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	3.677	12.00	60.51
OUTFLOW: ID= 1 (0030)	46.370	0.759	14.10	60.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.64
TIME SHIFT OF PEAK FLOW (min)=126.00
MAXIMUM STORAGE USED (ha.m.)= 0.7666

CALIB
NASHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW	(cms)=	0.182 (i)
TIME TO PEAK	(hrs)=	12.000
RUNOFF VOLUME	(mm)=	45.459
TOTAL RAINFALL	(mm)=	95.962
RUNOFF COEFFICIENT	=	0.474

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.02	6.200	2.03	12.200	18.80	18.20	2.03
0.400	1.02	6.400	2.03	12.400	11.68	18.40	2.03
0.600	1.02	6.600	2.03	12.600	8.38	18.60	2.03
0.800	1.02	6.800	2.03	12.800	8.13	18.80	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.200	1.02	7.200	2.03	13.200	4.83	19.20	1.52
1.400	1.02	7.400	2.03	13.400	4.83	19.40	1.52
1.600	1.02	7.600	2.03	13.600	4.83	19.60	1.52
1.800	1.02	7.800	2.03	13.800	4.83	19.80	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.200	1.02	8.200	2.79	14.200	2.79	20.20	1.52
2.400	1.02	8.400	2.79	14.400	2.79	20.40	1.52
2.600	1.02	8.600	2.79	14.600	2.79	20.60	1.52
2.800	1.02	8.800	2.79	14.800	2.79	20.80	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.200	1.02	9.200	2.79	15.200	2.79	21.20	1.02
3.400	1.02	9.400	2.79	15.400	2.79	21.40	1.02
3.600	1.02	9.600	2.79	15.600	2.79	21.60	1.02
3.800	1.02	9.800	2.79	15.800	2.79	21.80	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.200	2.03	10.200	5.08	16.200	2.03	22.20	1.02
4.400	2.03	10.400	5.08	16.400	2.03	22.40	1.02
4.600	2.03	10.600	5.08	16.600	2.03	22.60	1.02
4.800	2.03	10.800	5.08	16.800	2.03	22.80	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.200	2.03	11.200	7.11	17.200	2.03	23.20	1.02
5.400	2.03	11.400	10.41	17.400	2.03	23.40	1.02
5.600	2.03	11.600	23.37	17.600	2.03	23.60	1.02
5.800	2.03	11.800	51.56	17.800	2.03	23.80	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	0.00

				TOTALS
Max.Eff.Inten.(mm/hr)=		107.44	63.42	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
PEAK FLOW	(cms)=	0.28	0.08	0.359 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42	78.07
TOTAL RAINFALL	(mm)=	95.76	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51	0.82

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

				TOTALS
Max.Eff.Inten.(mm/hr)=		107.44	63.42	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
PEAK FLOW	(cms)=	0.30	0.41	0.714 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42	61.39
TOTAL RAINFALL	(mm)=	95.76	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51	0.64

***** 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 (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.359	12.00	78.07
+ ID2= 2 (0005):	1.33	0.182	12.00	45.46
ID = 3 (0007):	2.78	0.541	12.00	62.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.541	12.00	62.70
+ ID2= 2 (0063):	3.62	0.714	12.00	61.39
ID = 1 (0007):	6.40	1.255	12.00	62.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	1.255	12.00	62.15
OUTFLOW: ID= 1 (0033)	6.400	0.101	12.92	62.06

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.01
TIME SHIFT OF PEAK FLOW (min)= 55.00
MAXIMUM STORAGE USED (ha.m.)= 0.2156

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41

0.43	.382E+03	1.0	2.18	6.51	
0.52	.492E+03	1.4	2.41	5.88	
0.61	.608E+03	1.9	2.61	5.43	
0.69	.727E+03	2.4	2.79	5.08	
0.78	.848E+03	2.9	2.95	4.81	
0.87	.970E+03	3.5	3.08	4.60	
0.96	.109E+04	4.1	3.20	4.43	
1.04	.121E+04	4.7	3.29	4.31	
1.13	.133E+04	5.2	3.36	4.22	
1.22	.144E+04	5.8	3.41	4.15	
1.30	.154E+04	6.2	3.44	4.12	
1.39	.163E+04	6.6	3.43	4.13	
1.48	.172E+04	6.9	3.40	4.17	
1.56	.178E+04	6.9	3.31	4.28	
1.65	.182E+04	6.5	3.02	4.70	

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.10	12.92	62.06	0.14	1.01
OUTFLOW: ID= 1 (0034)	6.40	0.10	13.08	62.05	0.14	1.00

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.855 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 44.141
TOTAL RAINFALL (mm)= 95.758
RUNOFF COEFFICIENT = 0.461

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 1.059 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 44.572
TOTAL RAINFALL (mm)= 95.758
RUNOFF COEFFICIENT = 0.465

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.196 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 44.871
TOTAL RAINFALL (mm)= 95.758
RUNOFF COEFFICIENT = 0.469

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	10.97	7.01
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

				TOTALS
Max.Eff.Inten.	(mm/hr)=	107.44	63.42	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
PEAK FLOW	(cms)=	3.27	1.11	4.380 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42	76.68
TOTAL RAINFALL	(mm)=	95.76	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51	0.80

***** 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 (0039)
ID= 1 DT=12.0 min

Area (ha)= 1.21
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.67	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

				TOTALS
Max.Eff.Inten.	(mm/hr)=	107.44	63.42	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
PEAK FLOW	(cms)=	0.20	0.09	0.285 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42	73.90
TOTAL RAINFALL	(mm)=	95.76	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51	0.77

***** 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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.28	12.00	73.90
MAJOR SYS.(ID= 2):	0.11	0.12	12.00	73.90
MINOR SYS.(ID= 3):	1.10	0.17	12.00	73.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0047)
ID= 1 DT=12.0 min

Area (ha)= 1.50
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.96	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

				TOTALS
Max.Eff.Inten.	(mm/hr)=	107.44	63.42	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	

```
     PEAK FLOW       (cms)=       0.29          0.09          0.372 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      94.76         48.42          78.07
     TOTAL RAINFALL   (mm)=      95.76         95.76          95.76
     RUNOFF COEFFICIENT   =       0.99          0.51           0.82

***** 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.

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--------------------
| DUHYD     (0072) |
| Inlet Cap.=0.363 |
| #of Inlets=    1 |
| Total(cms)=  0.4 |       AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.50      0.37     12.00    78.07
     ==========================================================
     MAJOR SYS.(ID= 2):   0.01      0.01     12.00    78.07
     MINOR SYS.(ID= 3):   1.49      0.36     12.00    78.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0035):      8.03   0.855    12.00    44.14
       + ID2= 2 (0036):     17.98   4.380    12.00    76.68
         ==================================================
         ID = 3 (0040):     26.01   5.234    12.00    66.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0040):     26.01   5.234    12.00    66.64
       + ID2= 2 (0037):     10.64   1.059    12.00    44.57
         ==================================================
         ID = 1 (0040):     36.65   6.293    12.00    60.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0040):     36.65   6.293    12.00    60.23
       + ID2= 2 (0038):      2.11   0.196    12.00    44.87
         ==================================================
         ID = 3 (0040):     38.76   6.489    12.00    59.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0040):     38.76   6.489    12.00    59.40
       + ID2= 2 (0072):      0.01   0.009    12.00    78.07
         ==================================================
         ID = 1 (0040):     38.77   6.497    12.00    59.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0040):     38.77   6.497    12.00    59.40
       + ID2= 2 (0074):      0.11   0.116    12.00    73.90
         ==================================================
         ID = 3 (0040):     38.88   6.613    12.00    59.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0041) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0034):      6.40   0.100    13.08    62.05
       + ID2= 2 (0040):     38.88   6.613    12.00    59.44
         ==================================================
         ID = 3 (0041):     45.28   6.650    12.00    60.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000     |  3.1150      0.9004
                         1.2740     0.5550     |  3.6250      1.1600
                         2.2650     0.7154     |  3.9640      1.3570

                                  AREA     QPEAK     TPEAK      R.V.
                                  (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0041)      45.281     6.650     12.00     60.06
     OUTFLOW: ID= 1 (0043)      45.281     2.415     12.25     60.05

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 36.32
                   TIME SHIFT OF PEAK FLOW         (min)= 15.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=  0.7482

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--------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.336 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  28.869
     TOTAL RAINFALL   (mm)=  95.758
     RUNOFF COEFFICIENT   =   0.301

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.228 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  44.377
     TOTAL RAINFALL   (mm)=  95.758
     RUNOFF COEFFICIENT   =   0.463

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71          3.45
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250
```

Max.Eff.Inten.(mm/hr)=	107.44	63.42		
over (min)	12.00	12.00		
Storage Coeff. (min)=	0.98 (ii)	6.57 (ii)		
Unit Hyd. Tpeak (min)=	12.00	12.00		
Unit Hyd. peak (cms)=	0.14	0.12		
			TOTALS	
PEAK FLOW (cms)=	2.00	0.54	2.546 (iii)	
TIME TO PEAK (hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME (mm)=	94.76	48.42	79.00	
TOTAL RAINFALL (mm)=	95.76	95.76	95.76	
RUNOFF COEFFICIENT =	0.99	0.51	0.83	

***** 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 (0059)
ID= 1 DT=12.0 min

Area (ha)= 1.27
Total Imp(%)= 68.00 Dir. Conn.(%)= 68.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=		0.86	0.41
Dep. Storage (mm)=		1.00	1.50
Average Slope (%)=		2.00	2.00
Length (m)=		30.00	20.00
Mannings n =		0.013	0.250

Max.Eff.Inten.(mm/hr)=	107.44	63.42		
over (min)	12.00	12.00		
Storage Coeff. (min)=	0.98 (ii)	6.57 (ii)		
Unit Hyd. Tpeak (min)=	12.00	12.00		
Unit Hyd. peak (cms)=	0.14	0.12		
			TOTALS	
PEAK FLOW (cms)=	0.26	0.06	0.322 (iii)	
TIME TO PEAK (hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME (mm)=	94.76	48.42	79.93	
TOTAL RAINFALL (mm)=	95.76	95.76	95.76	
RUNOFF COEFFICIENT =	0.99	0.51	0.83	

***** 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.

DUHYD (0069)
Inlet Cap.=0.320
#of Inlets= 1
Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.32	12.00	79.93
MAJOR SYS.(ID= 2):	0.00	0.00	12.00	79.93
MINOR SYS.(ID= 3):	1.27	0.32	12.00	79.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0070)
ID= 1 DT=12.0 min

Area (ha)= 2.50
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=		1.38	1.12
Dep. Storage (mm)=		1.00	1.50
Average Slope (%)=		2.00	2.00
Length (m)=		30.00	20.00
Mannings n =		0.013	0.250

Max.Eff.Inten.(mm/hr)=	107.44	63.42		
over (min)	12.00	12.00		
Storage Coeff. (min)=	0.98 (ii)	6.57 (ii)		
Unit Hyd. Tpeak (min)=	12.00	12.00		
Unit Hyd. peak (cms)=	0.14	0.12		
			TOTALS	
PEAK FLOW (cms)=	0.41	0.18	0.588 (iii)	
TIME TO PEAK (hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME (mm)=	94.76	48.42	73.90	
TOTAL RAINFALL (mm)=	95.76	95.76	95.76	
RUNOFF COEFFICIENT =	0.99	0.51	0.77	

***** 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.

DUHYD (0071)
Inlet Cap.=0.550
#of Inlets= 1
Total(cms)= 0.6

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.50	0.59	12.00	73.90
MAJOR SYS.(ID= 2):	0.04	0.04	12.00	73.90
MINOR SYS.(ID= 3):	2.46	0.55	12.00	73.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0044):	3.28	0.336	12.00	28.87
+ ID2= 2 (0045):	10.16	2.546	12.00	79.00
ID = 3 (0048):	13.44	2.882	12.00	66.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	13.44	2.882	12.00	66.77
+ ID2= 2 (0046):	2.21	0.228	12.00	44.38
ID = 1 (0048):	15.65	3.109	12.00	63.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0048):	15.65	3.109	12.00	63.61
+ ID2= 2 (0069):	1.27	0.320	12.00	79.93
ID = 3 (0048):	16.92	3.429	12.00	64.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	16.92	3.429	12.00	64.83
+ ID2= 2 (0071):	2.46	0.550	12.00	73.90
ID = 1 (0048):	19.38	3.979	12.00	65.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
   ID1= 1 (0048):    19.38   3.979    12.00    65.98
 + ID2= 2 (0072):     1.49   0.363    12.00    78.07
   ================================================
   ID = 3 (0048):    20.87   4.342    12.00    66.85

 NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

RESERVOIR (0049) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.9630	0.3823
	0.5430	0.1233	1.3030	0.6907
	0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.873	4.342	12.00	66.85
OUTFLOW: ID= 1 (0049)	20.873	1.031	12.20	66.84

```
PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.74
TIME SHIFT OF PEAK FLOW          (min)= 12.00
MAXIMUM  STORAGE   USED        (ha.m.)=  0.4449
```

ROUTE PIPE (0050) IN= 2---> OUT= 1 DT= 5.0 min		
	Pipe Number	= 1.00
	Diameter (mm)	=1650.00
	Length (m)	= 467.00
	Slope (m/m)	= 0.006
	Manning n	= 0.013

<TRAVEL TIME TABLE>

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.87	1.03	12.20	66.84	0.43	2.35
OUTFLOW: ID= 1 (0050)	20.87	1.03	12.30	66.84	0.43	2.35

CALIB NASHYD (0054) ID= 1 DT=12.0 min				
	Area	(ha)= 1.34	Curve Number	(CN)= 74.0
	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.22		

```
Unit Hyd Qpeak  (cms)=   0.233

PEAK FLOW       (cms)=   0.143 (i)
TIME TO PEAK    (hrs)=  12.000
RUNOFF VOLUME    (mm)=  44.141
TOTAL RAINFALL   (mm)=  95.758
RUNOFF COEFFICIENT   =   0.461

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB NASHYD (0056) ID= 1 DT=12.0 min				
	Area	(ha)= 0.10	Curve Number	(CN)= 74.0
	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.05		

```
Unit Hyd Qpeak  (cms)=   0.076

PEAK FLOW       (cms)=   0.001 (i)
TIME TO PEAK    (hrs)=  12.000
RUNOFF VOLUME    (mm)=   3.935
TOTAL RAINFALL   (mm)=  95.758
RUNOFF COEFFICIENT   =   0.041

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB NASHYD (0058) ID= 1 DT=12.0 min				
	Area	(ha)= 2.51	Curve Number	(CN)= 74.0
	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.27		

```
Unit Hyd Qpeak  (cms)=   0.355

PEAK FLOW       (cms)=   0.225 (i)
TIME TO PEAK    (hrs)=  12.000
RUNOFF VOLUME    (mm)=  44.985
TOTAL RAINFALL   (mm)=  95.758
RUNOFF COEFFICIENT   =   0.470

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB STANDHYD (0057) ID= 1 DT=12.0 min				
	Area	(ha)= 0.47		
	Total Imp	(%)= 70.00	Dir. Conn.	(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.33	0.14	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	107.44	63.42	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.10	0.02	0.120 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42	80.85
TOTAL RAINFALL	(mm)=	95.76	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51	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.
```

ADD HYD (0073) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.120	12.00	80.85
+ ID2= 2 (0058):	2.51	0.225	12.00	44.99
ID = 3 (0073):	2.98	0.345	12.00	50.64

```
NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

DUHYD (0066) Inlet Cap.=0.181 #of Inlets= 1 Total(cms)= 0.2	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.34	12.00	50.64
MAJOR SYS.(ID= 2):	0.31	0.16	12.00	50.64
MINOR SYS.(ID= 3):	2.67	0.18	12.00	50.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0053)	Area (ha)= 5.86		
ID= 1 DT=12.0 min	Total Imp(%)= 56.00	Dir. Conn.(%)= 56.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.28	2.58	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		107.44	63.42	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.98	0.41	1.386 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42	74.37
TOTAL RAINFALL	(mm)=	95.76	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51	0.78

***** 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 (0055)	Area (ha)= 2.71		
ID= 1 DT=12.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 25.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		107.44	63.42	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.32	0.523 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42	60.00
TOTAL RAINFALL	(mm)=	95.76	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51	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.

CALIB			
STANDHYD (0065)	Area (ha)= 2.71		
ID= 1 DT=12.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 25.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		107.44	63.42
over (min)		12.00	12.00
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12
PEAK FLOW	(cms)=	0.20	0.32
TIME TO PEAK	(hrs)=	12.00	12.00
RUNOFF VOLUME	(mm)=	94.76	48.42
TOTAL RAINFALL	(mm)=	95.76	95.76
RUNOFF COEFFICIENT	=	0.99	0.51

		TOTALS
PEAK FLOW	(cms)=	0.523 (iii)
TIME TO PEAK	(hrs)=	12.00
RUNOFF VOLUME	(mm)=	60.00
TOTAL RAINFALL	(mm)=	95.76
RUNOFF COEFFICIENT	=	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 (0051)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0053):	5.86	1.386	12.00	74.37	
+ ID2= 2 (0054):	1.34	0.143	12.00	44.14	
ID = 3 (0051):	7.20	1.529	12.00	68.74	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0051):	7.20	1.529	12.00	68.74	
+ ID2= 2 (0055):	2.71	0.523	12.00	60.00	
ID = 1 (0051):	9.91	2.052	12.00	66.35	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0051):	9.91	2.052	12.00	66.35	
+ ID2= 2 (0056):	0.10	0.001	12.00	3.94	
ID = 3 (0051):	10.01	2.053	12.00	65.73	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0051):	10.01	2.053	12.00	65.73	
+ ID2= 2 (0065):	2.71	0.523	12.00	60.00	
ID = 1 (0051):	12.72	2.576	12.00	64.51	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0051):	12.72	2.576	12.00	64.51	
+ ID2= 2 (0066):	2.67	0.181	12.00	50.64	
ID = 3 (0051):	15.39	2.757	12.00	62.10	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

ID1= 3 (0051):	15.39	2.757	12.00	62.10
+ ID2= 2 (0069):	0.00	0.002	12.00	79.93
ID = 1 (0051):	15.40	2.759	12.00	62.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0050):	20.87	1.035	12.30	66.84
+ ID2= 2 (0051):	15.40	2.759	12.00	62.10
ID = 3 (0060):	36.27	3.570	12.00	64.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061) | IN= 2---> OUT= 1 | DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.5100	0.3577
0.2970	0.1233	0.6800	0.7154
0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.270	3.570	12.00	64.84
OUTFLOW: ID= 1 (0061)	36.270	0.703	14.10	64.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.68
TIME SHIFT OF PEAK FLOW (min)=126.00
MAXIMUM STORAGE USED (ha.m.)= 0.8115

****
** SIMULATION NUMBER: 5 **
****

READ STORM | Ptotal=108.06 mm

Filename: C:\Users\DMcBrayne\AppData\Local\Temp\122dfadb-b082-4939-8279-0906fc8de536\0f46b514
Comments: FIFTY YR SCS STORM 12 MIN TIME STEP 24 H

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	1.10	6.20	2.20	12.20	22.04	18.20	2.20
0.40	1.10	6.40	2.20	12.40	13.78	18.40	2.20
0.60	1.10	6.60	2.20	12.60	9.92	18.60	2.20
0.80	1.10	6.80	2.20	12.80	9.37	18.80	2.20
1.00	1.10	7.00	2.20	13.00	6.61	19.00	2.20
1.20	1.10	7.20	2.20	13.20	5.51	19.20	1.65
1.40	1.10	7.40	2.20	13.40	5.51	19.40	1.65
1.60	1.10	7.60	2.20	13.60	5.51	19.60	1.65
1.80	1.10	7.80	2.20	13.80	5.51	19.80	1.65
2.00	1.10	8.00	2.20	14.00	5.51	20.00	1.65
2.20	1.10	8.20	3.31	14.20	3.31	20.20	1.65
2.40	1.10	8.40	3.31	14.40	3.31	20.40	1.65
2.60	1.10	8.60	3.31	14.60	3.31	20.60	1.65
2.80	1.10	8.80	3.31	14.80	3.31	20.80	1.65
3.00	1.10	9.00	3.31	15.00	3.31	21.00	1.65
3.20	1.10	9.20	3.31	15.20	3.31	21.20	1.10
3.40	1.10	9.40	3.31	15.40	3.31	21.40	1.10
3.60	1.10	9.60	3.31	15.60	3.31	21.60	1.10
3.80	1.10	9.80	3.31	15.80	3.31	21.80	1.10
4.00	1.10	10.00	3.31	16.00	3.31	22.00	1.10
4.20	2.20	10.20	6.05	16.20	2.20	22.20	1.10
4.40	2.20	10.40	6.05	16.40	2.20	22.40	1.10
4.60	2.20	10.60	6.05	16.60	2.20	22.60	1.10
4.80	2.20	10.80	6.05	16.80	2.20	22.80	1.10
5.00	2.20	11.00	6.05	17.00	2.20	23.00	1.10
5.20	2.20	11.20	8.26	17.20	2.20	23.20	1.10
5.40	2.20	11.40	12.12	17.40	2.20	23.40	1.10
5.60	2.20	11.60	27.55	17.60	2.20	23.60	1.10
5.80	2.20	11.80	60.61	17.80	2.20	23.80	1.10
6.00	2.20	12.00	114.06	18.00	2.20	24.00	1.10

CALIB | NASHYD (0011) | ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.128 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 50.557
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.468

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0010) | ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	2.36	1.51	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.75	0.27	1.022 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	87.93
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.81

***** 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 (0012) | ID= 1 DT=12.0 min

Area (ha)= 6.86
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	4.18	2.68	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	213.85	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	3.11 (ii)	8.43 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
			TOTALS
PEAK FLOW (cms)=	1.31	0.45	1.764 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	57.99	87.93
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.81

***** 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 (0064) | Area (ha)= 2.95

|ID= 1 DT=12.0 min | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.74	2.21
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	114.06	71.61
over (min)	12.00	12.00
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

	TOTALS
PEAK FLOW (cms)=	0.23	0.40	0.635 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	70.26
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.65

***** 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 (0013)	1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):		3.87	1.022	12.00	87.93
+ ID2= 2 (0011):		0.91	0.128	12.00	50.56
ID = 3 (0013):		4.78	1.150	12.00	80.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)	3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):		4.78	1.150	12.00	80.81
+ ID2= 2 (0012):		6.86	1.764	12.00	87.93
ID = 1 (0013):		11.64	2.914	12.00	85.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)	1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):		11.64	2.914	12.00	85.00
+ ID2= 2 (0064):		2.95	0.635	12.00	70.26
ID = 3 (0013):		14.59	3.549	12.00	82.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)	IN= 2---> OUT= 1	DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
			0.0000	0.0000	0.6510	0.4563
			0.1220	0.1110	0.8770	0.7650
			0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	3.549	12.00	82.02
OUTFLOW: ID= 1 (0021)	14.590	0.677	12.30	82.01

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.07
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.4926

ROUTE PIPE (0031)	IN= 2---> OUT= 1	DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.68	12.30	82.01	0.36	1.95
OUTFLOW: ID= 1 (0031)	14.59	0.68	12.40	82.01	0.36	1.95

CALIB	NASHYD (0016)	ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.885 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 51.995
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.481

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	STANDHYD (0018)	ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.62	0.35
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	114.06	71.61
over (min)	12.00	12.00
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

	TOTALS
PEAK FLOW (cms)=	0.20	0.06	0.260 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	89.40
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.83

***** 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 (0017)	Area (ha)= 2.34				
ID= 1 DT=12.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00			

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.29	1.05	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	114.06	71.61	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.41	0.19	0.599 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	84.98
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.79

***** 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 (0019)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0016):	6.53	0.885	12.00	52.00	
+ ID2= 2 (0017):	2.34	0.599	12.00	84.98	
ID = 3 (0019):	8.87	1.483	12.00	60.70	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0019):	8.87	1.483	12.00	60.70	
+ ID2= 2 (0018):	0.97	0.260	12.00	89.40	
ID = 1 (0019):	9.84	1.743	12.00	63.53	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0019):	9.84	1.743	12.00	63.53	
+ ID2= 2 (0031):	14.59	0.677	12.40	82.01	
ID = 3 (0032):	24.43	2.227	12.00	74.56	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.6510	0.4564
	0.1220	0.0863	0.8770	0.7894
	0.3620	0.1603	0.0000	0.0000

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
24.430	2.227	12.00	74.56
24.430	0.649	13.60	74.56

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.13
TIME SHIFT OF PEAK FLOW (min)= 96.00
MAXIMUM STORAGE USED (ha.m.)= 0.4543

CALIB					
NASHYD (0023)	Area (ha)= 10.18	Curve Number (CN)= 74.0			
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.27				

Unit Hyd Qpeak (cms)= 1.440

PEAK FLOW	(cms)=	1.079 (i)
TIME TO PEAK	(hrs)=	12.000
RUNOFF VOLUME	(mm)=	54.299
TOTAL RAINFALL	(mm)=	108.064
RUNOFF COEFFICIENT	=	0.502

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0025)	Area (ha)= 2.59	Curve Number (CN)= 74.0			
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.22				

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW	(cms)=	0.323 (i)
TIME TO PEAK	(hrs)=	12.000
RUNOFF VOLUME	(mm)=	53.280
TOTAL RAINFALL	(mm)=	108.064
RUNOFF COEFFICIENT	=	0.493

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0027)	Area (ha)= 1.61	Curve Number (CN)= 74.0			
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.13				

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW	(cms)=	0.226 (i)
TIME TO PEAK	(hrs)=	12.000
RUNOFF VOLUME	(mm)=	44.700
TOTAL RAINFALL	(mm)=	108.064
RUNOFF COEFFICIENT	=	0.414

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0024)	Area (ha)= 6.71				
ID= 1 DT=12.0 min	Total Imp(%)= 71.00	Dir. Conn.(%)= 71.00			

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.76	1.95	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	114.06	71.61	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.51	0.35	1.862 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	92.83
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.86

***** 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 (0062) ID= 1 DT=12.0 min | Area (ha)= 0.85 | Total Imp(%)= 28.00 | Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		114.06	71.61
over (min)		12.00	12.00
Storage Coeff. (min)=		0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.08 0.11 0.186 (iii)
TIME TO PEAK	(hrs)=	12.00 12.00 12.00
RUNOFF VOLUME	(mm)=	107.06 57.99 71.73
TOTAL RAINFALL	(mm)=	108.06 108.06 108.06
RUNOFF COEFFICIENT	=	0.99 0.54 0.66

***** 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 (0028) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	1.079	12.00	54.30
+ ID2= 2 (0024):	6.71	1.862	12.00	92.83
ID = 3 (0028):	16.89	2.941	12.00	69.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	2.941	12.00	69.61
+ ID2= 2 (0025):	2.59	0.323	12.00	53.28
ID = 1 (0028):	19.48	3.264	12.00	67.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	3.264	12.00	67.44
+ ID2= 2 (0027):	1.61	0.226	12.00	44.70
ID = 3 (0028):	21.09	3.490	12.00	65.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	3.490	12.00	65.70
+ ID2= 2 (0062):	0.85	0.186	12.00	71.73
ID = 1 (0028):	21.94	3.677	12.00	65.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.649	13.60	74.56
+ ID2= 2 (0028):	21.94	3.677	12.00	65.94
ID = 3 (0029):	46.37	4.111	12.00	70.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030) IN= 2---> OUT= 1 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	4.111	12.00	70.50
OUTFLOW: ID= 1 (0030)	46.370	0.879	14.10	70.50

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.39
TIME SHIFT OF PEAK FLOW (min)=126.00
MAXIMUM STORAGE USED (ha.m.)= 0.8878

CALIB NASHYD (0005) ID= 1 DT= 5.0 min | Area (ha)= 1.33 | Ia (mm)= 5.00 | U.H. Tp(hrs)= 0.13 | Curve Number (CN)= 74.0 | # of Linear Res.(N)= 3.00

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	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.09	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10

3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.211 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 54.688
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.506

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.10	6.200	2.20	12.200	22.04	18.20	2.20
0.400	1.10	6.400	2.20	12.400	13.78	18.40	2.20
0.600	1.10	6.600	2.20	12.600	9.92	18.60	2.20
0.800	1.10	6.800	2.20	12.800	9.37	18.80	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.200	1.10	7.200	2.20	13.200	5.51	19.20	1.65
1.400	1.10	7.400	2.20	13.400	5.51	19.40	1.65
1.600	1.10	7.600	2.20	13.600	5.51	19.60	1.65
1.800	1.10	7.800	2.20	13.800	5.51	19.80	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.200	1.10	8.200	3.31	14.200	3.31	20.20	1.65
2.400	1.10	8.400	3.31	14.400	3.31	20.40	1.65
2.600	1.10	8.600	3.31	14.600	3.31	20.60	1.65
2.800	1.10	8.800	3.31	14.800	3.31	20.80	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.200	1.10	9.200	3.31	15.200	3.31	21.20	1.10
3.400	1.10	9.400	3.31	15.400	3.31	21.40	1.10
3.600	1.10	9.600	3.31	15.600	3.31	21.60	1.10
3.800	1.10	9.800	3.31	15.800	3.31	21.80	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.200	2.20	10.200	6.05	16.200	2.20	22.20	1.10
4.400	2.20	10.400	6.05	16.400	2.20	22.40	1.10
4.600	2.20	10.600	6.05	16.600	2.20	22.60	1.10
4.800	2.20	10.800	6.05	16.800	2.20	22.80	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.200	2.20	11.200	8.26	17.200	2.20	23.20	1.10
5.400	2.20	11.400	12.12	17.400	2.20	23.40	1.10
5.600	2.20	11.600	27.55	17.600	2.20	23.60	1.10
5.800	2.20	11.800	60.61	17.800	2.20	23.80	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	0.00

Max.Eff.Inten.(mm/hr)= 114.06 71.61
over (min) 12.00 12.00
Storage Coeff. (min)= 0.96 (ii) 6.28 (ii)
Unit Hyd. Tpeak (min)= 12.00 12.00
Unit Hyd. peak (cms)= 0.14 0.12

				TOTALS
PEAK FLOW	(cms)=	0.29	0.09	0.389 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	106.84	57.82	89.19
TOTAL RAINFALL	(mm)=	107.84	107.84	107.84
RUNOFF COEFFICIENT	=	0.99	0.54	0.83

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)= 114.06 71.61
over (min) 12.00 12.00
Storage Coeff. (min)= 0.96 (ii) 6.28 (ii)
Unit Hyd. Tpeak (min)= 12.00 12.00
Unit Hyd. peak (cms)= 0.14 0.12

				TOTALS
PEAK FLOW	(cms)=	0.32	0.47	0.794 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	106.84	57.82	71.55
TOTAL RAINFALL	(mm)=	107.84	107.84	107.84
RUNOFF COEFFICIENT	=	0.99	0.54	0.66

***** 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 (0007)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):		1.45	0.389	12.00	89.19
+ ID2= 2 (0005):		1.33	0.211	12.00	54.69
ID = 3 (0007):		2.78	0.599	12.00	72.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):		2.78	0.599	12.00	72.91
+ ID2= 2 (0063):		3.62	0.794	12.00	71.55
ID = 1 (0007):		6.40	1.393	12.00	72.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	1.393	12.00	72.34
OUTFLOW: ID= 1 (0033)	6.400	0.125	12.83	72.25

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.96
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 0.2499

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.12	12.83	72.25	0.15	1.11
OUTFLOW: ID= 1 (0034)	6.40	0.12	13.00	72.25	0.15	1.11

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 1.002 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 53.114
TOTAL RAINFALL (mm)= 107.844
RUNOFF COEFFICIENT = 0.493

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 1.247 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 53.632
TOTAL RAINFALL (mm)= 107.844
RUNOFF COEFFICIENT = 0.497

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.231 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 53.992
TOTAL RAINFALL (mm)= 107.844
RUNOFF COEFFICIENT = 0.501

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	10.97	7.01	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	3.47	1.27	4.746 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	106.84	57.82	87.72
TOTAL RAINFALL (mm)=	107.84	107.84	107.84
RUNOFF COEFFICIENT =	0.99	0.54	0.81

***** 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 (0039)
ID= 1 DT=12.0 min

Area (ha)= 1.21
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.67	0.54	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.21	0.10	0.310 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	106.84	57.82	84.78
TOTAL RAINFALL (mm)=	107.84	107.84	107.84
RUNOFF COEFFICIENT =	0.99	0.54	0.79

***** 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.

DUHYD (0074)					
Inlet Cap.=0.169					
#of Inlets= 1					
Total(cms)= 0.2		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
TOTAL HYD.(ID= 1):		1.21	0.31	12.00	84.78
MAJOR SYS.(ID= 2):		0.12	0.14	12.00	84.78
MINOR SYS.(ID= 3):		1.09	0.17	12.00	84.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0047)	Area (ha)= 1.50				
ID= 1 DT=12.0 min	Total Imp(%)= 64.00		Dir. Conn.(%)= 64.00		
		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	0.96	0.54		
Dep. Storage	(mm)=	1.00	1.50		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	30.00	20.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(mm/hr)=		114.06	71.61		
over (min)		12.00	12.00		
Storage Coeff. (min)=		0.96 (ii)	6.28 (ii)		
Unit Hyd. Tpeak (min)=		12.00	12.00		
Unit Hyd. peak (cms)=		0.14	0.12		
				TOTALS	
PEAK FLOW	(cms)=	0.30	0.10	0.402 (iii)	
TIME TO PEAK	(hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME	(mm)=	106.84	57.82	89.19	
TOTAL RAINFALL	(mm)=	107.84	107.84	107.84	
RUNOFF COEFFICIENT	=	0.99	0.54	0.83	

***** 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.

DUHYD (0072)					
Inlet Cap.=0.363					
#of Inlets= 1					
Total(cms)= 0.4		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
TOTAL HYD.(ID= 1):		1.50	0.40	12.00	89.19
MAJOR SYS.(ID= 2):		0.03	0.04	12.00	89.19
MINOR SYS.(ID= 3):		1.47	0.36	12.00	89.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0035):		8.03	1.002	12.00	53.11
+ ID2= 2 (0036):		17.98	4.746	12.00	87.72
ID = 3 (0040):		26.01	5.748	12.00	77.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0040):		26.01	5.748	12.00	77.04
+ ID2= 2 (0037):		10.64	1.247	12.00	53.63
ID = 1 (0040):		36.65	6.995	12.00	70.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0040):		36.65	6.995	12.00	70.24
+ ID2= 2 (0038):		2.11	0.231	12.00	53.99
ID = 3 (0040):		38.76	7.226	12.00	69.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0040):		38.76	7.226	12.00	69.36
+ ID2= 2 (0072):		0.03	0.039	12.00	89.19
ID = 1 (0040):		38.79	7.265	12.00	69.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0040):		38.79	7.265	12.00	69.38
+ ID2= 2 (0074):		0.12	0.141	12.00	84.78
ID = 3 (0040):		38.91	7.405	12.00	69.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0034):		6.40	0.124	13.00	72.25
+ ID2= 2 (0040):		38.91	7.405	12.00	69.42
ID = 3 (0041):		45.31	7.450	12.00	70.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0043)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	3.1150	0.9004
	1.2740	0.5550	3.6250	1.1600
	2.2650	0.7154	3.9640	1.3570

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0041)		45.311	7.450	12.00	70.08
OUTFLOW: ID= 1 (0043)		45.311	2.890	12.25	70.08

PEAK FLOW REDUCTION [Qout/Qin](%)= 38.79
TIME SHIFT OF PEAK FLOW (min)= 15.00
MAXIMUM STORAGE USED (ha.m.)= 0.8522

CALIB					
NASHYD (0044)	Area (ha)= 3.28		Curve Number (CN)= 74.0		
ID= 1 DT=12.0 min	Ia (mm)= 5.00		# of Linear Res.(N)= 3.00		
	U.H. Tp(hrs)= 0.10				

Unit Hyd Qpeak (cms)= 1.253

PEAK FLOW (cms)= 0.383 (i)

```
     TIME TO PEAK     (hrs)=  12.000
     RUNOFF VOLUME     (mm)=  34.737
     TOTAL RAINFALL    (mm)= 107.844
     RUNOFF COEFFICIENT    =   0.322

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.267 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  53.397
     TOTAL RAINFALL   (mm)= 107.844
     RUNOFF COEFFICIENT    =   0.495

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71         3.45
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.12         0.63         2.751 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=     106.84        57.82        90.18
     TOTAL RAINFALL   (mm)=     107.84       107.84       107.84
     RUNOFF COEFFICIENT    =      0.99         0.54         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.

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--------------------
| CALIB            |
| STANDHYD  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.86         0.41
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.07         0.347 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=     106.84        57.82        91.16
     TOTAL RAINFALL   (mm)=     107.84       107.84       107.84
     RUNOFF COEFFICIENT    =      0.99         0.54         0.85

***** 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.

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--------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |          AREA     QPEAK     TPEAK     R.V.
--------------------          (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.27      0.35      12.00    91.16
     ================================================
     MAJOR SYS.(ID= 2):   0.02      0.03      12.00    91.16
     MINOR SYS.(ID= 3):   1.25      0.32      12.00    91.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0070) |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.38         1.12
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.44         0.20         0.640 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=     106.84        57.82        84.78
     TOTAL RAINFALL   (mm)=     107.84       107.84       107.84
     RUNOFF COEFFICIENT    =      0.99         0.54         0.79

***** 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.

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--------------------
| DUHYD     (0071) |
| Inlet Cap.=0.550 |
| #of Inlets=    1 |
| Total(cms)=  0.6 |          AREA     QPEAK     TPEAK     R.V.
--------------------          (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.50      0.64      12.00    84.78
     ================================================
     MAJOR SYS.(ID= 2):   0.08      0.09      12.00    84.78
     MINOR SYS.(ID= 3):   2.42      0.55      12.00    84.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28   0.383    12.00    34.74
        + ID2= 2 (0045):    10.16   2.751    12.00    90.18
          ================================================
          ID = 3 (0048):    13.44   3.134    12.00    76.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44   3.134    12.00    76.65
        + ID2= 2 (0046):     2.21   0.267    12.00    53.40
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          ==============================================
          ID = 1 (0048):    15.65   3.401    12.00    73.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65   3.401    12.00    73.36
        + ID2= 2 (0069):     1.25   0.320    12.00    91.16
          ==============================================
          ID = 3 (0048):    16.90   3.721    12.00    74.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.90   3.721    12.00    74.68
        + ID2= 2 (0071):     2.42   0.550    12.00    84.78
          ==============================================
          ID = 1 (0048):    19.32   4.271    12.00    75.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.32   4.271    12.00    75.95
        + ID2= 2 (0072):     1.47   0.363    12.00    89.19
          ==============================================
          ID = 3 (0048):    20.79   4.634    12.00    76.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| RESERVOIR (0049) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                         0.0000     0.0000    |   0.9630      0.3823
                         0.5430     0.1233    |   1.3030      0.6907
                         0.7650     0.2343    |   1.5860      1.0977

                              AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0048)    20.791     4.634     12.00      76.88
     OUTFLOW: ID= 1 (0049)    20.791     1.103     12.30      76.88

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.79
                    TIME SHIFT OF PEAK FLOW          (min)= 18.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.5107

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-------------------
| ROUTE PIPE (0050)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 467.00
-------------------      Slope      (m/m)=  0.006
                         Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME    FLOW RATE    VELOCITY    TRAV.TIME
         (m)     (cu.m.)      (cms)        (m/s)        min
        0.09    .201E+02        0.0         0.88         8.87
        0.17    .560E+02        0.2         1.37         5.68
        0.26    .101E+03        0.4         1.76         4.42
        0.35    .153E+03        0.7         2.09         3.72
        0.43    .210E+03        1.1         2.38         3.27
        0.52    .270E+03        1.5         2.64         2.95
        0.61    .334E+03        2.0         2.86         2.72
        0.69    .399E+03        2.6         3.06         2.55
        0.78    .466E+03        3.2         3.23         2.41
        0.87    .533E+03        3.9         3.38         2.31
        0.96    .599E+03        4.5         3.50         2.22
        1.04    .665E+03        5.1         3.60         2.16
        1.13    .728E+03        5.7         3.68         2.11
        1.22    .789E+03        6.3         3.74         2.08
        1.30    .846E+03        6.8         3.76         2.07
        1.39    .897E+03        7.2         3.76         2.07
        1.48    .943E+03        7.5         3.72         2.09
        1.56    .978E+03        7.6         3.63         2.15
        1.65    .999E+03        7.1         3.30         2.36

                                <---- hydrograph ---->   <-pipe / channel->
                                 AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                  (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0049)    20.79     1.10    12.30   76.88      0.44      2.40
     OUTFLOW: ID= 1 (0050)    20.79     1.11    12.30   76.88      0.44      2.40

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-------------------
| CALIB            |
| NASHYD    (0054) |   Area     (ha)=   1.34   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.233

     PEAK FLOW       (cms)=   0.167 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  53.113
     TOTAL RAINFALL   (mm)= 107.844
     RUNOFF COEFFICIENT   =   0.492

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0056) |   Area     (ha)=   0.10   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.05

     Unit Hyd Qpeak  (cms)=   0.076

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=   4.735
     TOTAL RAINFALL   (mm)= 107.844
     RUNOFF COEFFICIENT   =   0.044

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

-------------------
| CALIB            |
| NASHYD    (0058) |   Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.266 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  54.130
     TOTAL RAINFALL   (mm)= 107.844
     RUNOFF COEFFICIENT   =   0.502

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0057) |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        0.33          0.14
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      114.06         71.61
               over (min)         12.00         12.00
     Storage Coeff.  (min)=        0.96 (ii)     6.28 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.10          0.03          0.130 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00          12.00
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```
     RUNOFF VOLUME     (mm)=     106.84        57.82          92.13
     TOTAL RAINFALL    (mm)=     107.84       107.84         107.84
     RUNOFF COEFFICIENT   =       0.99         0.54           0.85

***** 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.

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-------------------
| ADD HYD   (0073) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)      (mm)
         ID1= 1 (0057):     0.47   0.130    12.00    92.13
       + ID2= 2 (0058):     2.51   0.266    12.00    54.13
         ================================================
         ID = 3 (0073):     2.98   0.396    12.00    60.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0066) |
| Inlet Cap.=0.181 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |      AREA     QPEAK     TPEAK     R.V.
-------------------      (ha)      (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.98      0.40     12.00    60.12
     ================================================
     MAJOR SYS.(ID= 2):   0.37      0.21     12.00    60.12
     MINOR SYS.(ID= 3):   2.61      0.18     12.00    60.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD  (0053) |   Area    (ha)=   5.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.28         2.58
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.04         0.47          1.507 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=     106.84        57.82         85.27
     TOTAL RAINFALL   (mm)=     107.84       107.84        107.84
     RUNOFF COEFFICIENT   =       0.99         0.54          0.79

***** 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  (0055) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.37          0.583 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=     106.84        57.82         70.08
     TOTAL RAINFALL   (mm)=     107.84       107.84        107.84
     RUNOFF COEFFICIENT   =       0.99         0.54          0.65

***** 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  (0065) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.37          0.583 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=     106.84        57.82         70.08
     TOTAL RAINFALL   (mm)=     107.84       107.84        107.84
     RUNOFF COEFFICIENT   =       0.99         0.54          0.65

***** 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.

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-------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)      (mm)
         ID1= 1 (0053):     5.86   1.507    12.00    85.27
       + ID2= 2 (0054):     1.34   0.167    12.00    53.11
         ================================================
         ID = 3 (0051):     7.20   1.674    12.00    79.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)      (mm)
         ID1= 3 (0051):     7.20   1.674    12.00    79.29
       + ID2= 2 (0055):     2.71   0.583    12.00    70.08
         ================================================
         ID = 1 (0051):     9.91   2.257    12.00    76.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)      (mm)
         ID1= 1 (0051):     9.91   2.257    12.00    76.77
       + ID2= 2 (0056):     0.10   0.002    12.00     4.74
```

```
          ================================================
          ID = 3 (0051):    10.01   2.259    12.00    76.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =   1   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 3 (0051):    10.01   2.259    12.00    76.05
        + ID2= 2 (0065):     2.71   0.583    12.00    70.08
          ================================================
          ID = 1 (0051):    12.72   2.842    12.00    74.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0051):    12.72   2.842    12.00    74.78
        + ID2= 2 (0066):     2.61   0.181    12.00    60.12
          ================================================
          ID = 3 (0051):    15.33   3.023    12.00    72.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =   1   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 3 (0051):    15.33   3.023    12.00    72.28
        + ID2= 2 (0069):     0.02   0.027    12.00    91.16
          ================================================
          ID = 1 (0051):    15.35   3.050    12.00    72.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0060) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0050):    20.79   1.106    12.30    76.88
        + ID2= 2 (0051):    15.35   3.050    12.00    72.31
          ================================================
          ID = 3 (0060):    36.15   3.932    12.00    74.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0061) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                          0.0000     0.0000    |    0.5100     0.3577
                          0.2970     0.1233    |    0.6800     0.7154
                          0.4250     0.2220    |    0.7930     1.1964

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0060)    36.145     3.932     12.00      74.95
     OUTFLOW: ID= 1 (0061)    36.145     0.740     14.20      74.94

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.82
                    TIME SHIFT OF PEAK FLOW          (min)=132.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.9702

--------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:   6 **
  ****************************


--------------------
|    READ STORM    |    Filename: C:\Users\DMcBrayne\AppD
|                  |              ata\Local\Temp\
|                  |              122dfadb-b082-4939-8279-0906fc8de536\86a632a5
```

```
| Ptotal=112.42 mm |    Comments: SCS TYPE II TWENTY FOUR HOUR, HUNDRED YE
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	1.27	6.20	2.29	12.20	21.84	18.20	2.29
0.40	1.27	6.40	2.29	12.40	13.72	18.40	2.29
0.60	1.27	6.60	2.29	12.60	9.91	18.60	2.29
0.80	1.27	6.80	2.29	12.80	9.40	18.80	2.29
1.00	1.27	7.00	2.29	13.00	6.60	19.00	2.29
1.20	1.27	7.20	2.29	13.20	5.59	19.20	1.78
1.40	1.27	7.40	2.29	13.40	5.59	19.40	1.78
1.60	1.27	7.60	2.29	13.60	5.59	19.60	1.78
1.80	1.27	7.80	2.29	13.80	5.59	19.80	1.78
2.00	1.27	8.00	2.29	14.00	5.59	20.00	1.78
2.20	1.27	8.20	3.30	14.20	3.30	20.20	1.78
2.40	1.27	8.40	3.30	14.40	3.30	20.40	1.78
2.60	1.27	8.60	3.30	14.60	3.30	20.60	1.78
2.80	1.27	8.80	3.30	14.80	3.30	20.80	1.78
3.00	1.27	9.00	3.30	15.00	3.30	21.00	1.78
3.20	1.27	9.20	3.30	15.20	3.30	21.20	1.27
3.40	1.27	9.40	3.30	15.40	3.30	21.40	1.27
3.60	1.27	9.60	3.30	15.60	3.30	21.60	1.27
3.80	1.27	9.80	3.30	15.80	3.30	21.80	1.27
4.00	1.27	10.00	3.30	16.00	3.30	22.00	1.27
4.20	2.29	10.20	6.10	16.20	2.29	22.20	1.27
4.40	2.29	10.40	6.10	16.40	2.29	22.40	1.27
4.60	2.29	10.60	6.10	16.60	2.29	22.60	1.27
4.80	2.29	10.80	6.10	16.80	2.29	22.80	1.27
5.00	2.29	11.00	6.10	17.00	2.29	23.00	1.27
5.20	2.29	11.20	8.13	17.20	2.29	23.20	1.27
5.40	2.29	11.40	11.94	17.40	2.29	23.40	1.27
5.60	2.29	11.60	27.43	17.60	2.29	23.60	1.27
5.80	2.29	11.80	59.94	17.80	2.29	23.80	1.27
6.00	2.29	12.00	126.49	18.00	2.29	24.00	1.27

```
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD    (0011) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.204

     PEAK FLOW       (cms)=   0.142 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  53.705
     TOTAL RAINFALL   (mm)= 112.420
     RUNOFF COEFFICIENT   =   0.478

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0010) |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=        2.36          1.51
     Dep. Storage      (mm)=        1.00          1.50
     Average Slope      (%)=        2.00          2.00
     Length             (m)=       30.00         20.00
     Mannings n            =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      126.49         80.66
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       0.92 (ii)     5.99 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.83          0.31        1.138 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=      111.42         61.47         91.94
     TOTAL RAINFALL   (mm)=      112.42        112.42        112.42
     RUNOFF COEFFICIENT   =        0.99          0.55          0.82

***** 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  (0012)     |   Area    (ha)=   6.86
|ID= 1 DT=12.0 min     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	213.85	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		126.49	80.66	
over (min)		12.00	12.00	
Storage Coeff. (min)=		2.98 (ii)	8.05 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	1.46	0.51	1.966 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	111.42	61.47	91.94
TOTAL RAINFALL	(mm)=	112.42	112.42	112.42
RUNOFF COEFFICIENT	=	0.99	0.55	0.82

***** 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  (0064)     |   Area    (ha)=   2.95
|ID= 1 DT=12.0 min     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.74	2.21	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		126.49	80.66	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.92 (ii)	5.99 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.26	0.45	0.712 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	111.42	61.47	73.95
TOTAL RAINFALL	(mm)=	112.42	112.42	112.42
RUNOFF COEFFICIENT	=	0.99	0.55	0.66

***** 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   (0013)     |
|   1 +  2 =  3        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	1.138	12.00	91.94
+ ID2= 2 (0011):	0.91	0.142	12.00	53.70
ID = 3 (0013):	4.78	1.281	12.00	84.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0013)     |
|   3 +  2 =  1        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	1.281	12.00	84.66
+ ID2= 2 (0012):	6.86	1.966	12.00	91.94
ID = 1 (0013):	11.64	3.247	12.00	88.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0013)     |
|   1 +  2 =  3        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	3.247	12.00	88.95
+ ID2= 2 (0064):	2.95	0.712	12.00	73.95
ID = 3 (0013):	14.59	3.959	12.00	85.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| RESERVOIR (0021)     |
| IN= 2---> OUT= 1     |
| DT=  5.0 min         |
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	3.959	12.00	85.92
OUTFLOW: ID= 1 (0021)	14.590	0.698	12.30	85.90

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.62
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.5210

```
| ROUTE PIPE (0031)    |
| IN= 2---> OUT= 1     |
| DT=  5.0 min         |
```

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.70	12.30	85.90	0.36	1.96
OUTFLOW: ID= 1 (0031)	14.59	0.70	12.40	85.90	0.36	1.96

```
| CALIB                |
| NASHYD    (0016)     |   Area    (ha)=   6.53   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
                       |   U.H. Tp(hrs)=   0.19
```

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.977 (i)
TIME TO PEAK (hrs)= 12.000

```
     RUNOFF VOLUME     (mm)=  55.233
     TOTAL RAINFALL    (mm)= 112.420
     RUNOFF COEFFICIENT    =   0.491

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0018)  |   Area     (ha)=   0.97
|ID= 1 DT=12.0 min  |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.62         0.35
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
               over (min)        12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.22         0.07        0.290 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47        93.44
     TOTAL RAINFALL   (mm)=    112.42       112.42       112.42
     RUNOFF COEFFICIENT    =     0.99         0.55         0.83

***** 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  (0017)  |   Area     (ha)=   2.34
|ID= 1 DT=12.0 min  |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.29         1.05
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
               over (min)        12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.45         0.22        0.668 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47        88.94
     TOTAL RAINFALL   (mm)=    112.42       112.42       112.42
     RUNOFF COEFFICIENT    =     0.99         0.55         0.79

***** 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   (0019)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (0016):      6.53   0.977    12.00    55.23
      + ID2= 2 (0017):      2.34   0.668    12.00    88.94
        ================================================
        ID = 3 (0019):      8.87   1.645    12.00    64.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0019)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (0019):      8.87   1.645    12.00    64.12
      + ID2= 2 (0018):      0.97   0.290    12.00    93.44
        ================================================
        ID = 1 (0019):      9.84   1.935    12.00    67.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0032)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (0019):      9.84   1.935    12.00    67.01
      + ID2= 2 (0031):     14.59   0.698    12.40    85.90
        ================================================
        ID = 3 (0032):     24.43   2.430    12.00    78.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0022)  |
| IN= 2---> OUT= 1  |
| DT=  5.0 min      |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.6510     0.4564
                         0.1220     0.0863    |   0.8770     0.7894
                         0.3620     0.1603    |   0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0032)    24.430     2.430     12.00      78.29
     OUTFLOW: ID= 1 (0022)    24.430     0.666     13.60      78.29

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 27.39
          TIME SHIFT OF PEAK FLOW          (min)= 96.00
          MAXIMUM  STORAGE   USED        (ha.m.)=  0.4781

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0023)  |   Area     (ha)=  10.18   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   1.174 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  57.680
     TOTAL RAINFALL   (mm)= 112.420
     RUNOFF COEFFICIENT    =   0.513

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0025)  |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.355 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  56.597
     TOTAL RAINFALL   (mm)= 112.420
     RUNOFF COEFFICIENT    =   0.503

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0027)  |   Area     (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473
```

```
     PEAK FLOW       (cms)=   0.253 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  47.484
     TOTAL RAINFALL   (mm)= 112.420
     RUNOFF COEFFICIENT   =   0.422

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0024) |   Area    (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.76         1.95
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      1.67         0.40         2.072 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47        96.93
     TOTAL RAINFALL   (mm)=    112.42       112.42       112.42
     RUNOFF COEFFICIENT   =      0.99         0.55         0.86

***** 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  (0062) |   Area    (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.61
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.08         0.13         0.209 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47        75.45
     TOTAL RAINFALL   (mm)=    112.42       112.42       112.42
     RUNOFF COEFFICIENT   =      0.99         0.55         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   (0028) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0023):    10.18   1.174    12.00    57.68
        + ID2= 2 (0024):     6.71   2.072    12.00    96.93
          ================================================
          ID = 3 (0028):    16.89   3.247    12.00    73.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0028) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0028):    16.89   3.247    12.00    73.27
        + ID2= 2 (0025):     2.59   0.355    12.00    56.60
          ================================================
          ID = 1 (0028):    19.48   3.601    12.00    71.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0028) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0028):    19.48   3.601    12.00    71.06
        + ID2= 2 (0027):     1.61   0.253    12.00    47.48
          ================================================
          ID = 3 (0028):    21.09   3.854    12.00    69.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0028) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0028):    21.09   3.854    12.00    69.26
        + ID2= 2 (0062):     0.85   0.209    12.00    75.45
          ================================================
          ID = 1 (0028):    21.94   4.063    12.00    69.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0029) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0022):    24.43   0.666    13.60    78.29
        + ID2= 2 (0028):    21.94   4.063    12.00    69.50
          ================================================
          ID = 3 (0029):    46.37   4.506    12.00    74.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0030) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |     (cms)     (ha.m.)
                          0.0000     0.0000    |    1.3030      1.3940
                          0.4380     0.4440    |    1.5000      1.8008
                          0.9910     1.0000    |    1.7560      2.3930

                             AREA     QPEAK     TPEAK      R.V.
                             (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0029)     46.370     4.506     12.00      74.16
     OUTFLOW: ID= 1 (0030)     46.370     0.915     14.00      74.15

          PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.31
          TIME SHIFT OF PEAK FLOW          (min)=120.00
          MAXIMUM  STORAGE   USED        (ha.m.)=  0.9240

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0005) |   Area     (ha)=   1.33   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)=   0.13

     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	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.234 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 58.093
TOTAL RAINFALL (mm)= 112.421
RUNOFF COEFFICIENT = 0.517

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

STANDHYD (0004)	ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.27	6.200	2.29	12.200	21.85	18.20	2.29
0.400	1.27	6.400	2.29	12.400	13.72	18.40	2.29
0.600	1.27	6.600	2.29	12.600	9.91	18.60	2.29
0.800	1.27	6.800	2.29	12.800	9.40	18.80	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.200	1.27	7.200	2.29	13.200	5.59	19.20	1.78
1.400	1.27	7.400	2.29	13.400	5.59	19.40	1.78
1.600	1.27	7.600	2.29	13.600	5.59	19.60	1.78
1.800	1.27	7.800	2.29	13.800	5.59	19.80	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.200	1.27	8.200	3.30	14.200	3.30	20.20	1.78
2.400	1.27	8.400	3.30	14.400	3.30	20.40	1.78
2.600	1.27	8.600	3.30	14.600	3.30	20.60	1.78
2.800	1.27	8.800	3.30	14.800	3.30	20.80	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.200	1.27	9.200	3.30	15.200	3.30	21.20	1.27
3.400	1.27	9.400	3.30	15.400	3.30	21.40	1.27
3.600	1.27	9.600	3.30	15.600	3.30	21.60	1.27
3.800	1.27	9.800	3.30	15.800	3.30	21.80	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.200	2.29	10.200	6.10	16.200	2.29	22.20	1.27
4.400	2.29	10.400	6.10	16.400	2.29	22.40	1.27
4.600	2.29	10.600	6.10	16.600	2.29	22.60	1.27
4.800	2.29	10.800	6.10	16.800	2.29	22.80	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.200	2.29	11.200	8.13	17.200	2.29	23.20	1.27
5.400	2.29	11.400	11.94	17.400	2.29	23.40	1.27
5.600	2.29	11.600	27.43	17.600	2.29	23.60	1.27
5.800	2.29	11.800	59.94	17.800	2.29	23.80	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	0.00

				TOTALS
Max.Eff.Inten.	(mm/hr)=	126.49	80.66	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.92 (ii)	5.99 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
PEAK FLOW	(cms)=	0.33	0.11	0.433 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	111.17	61.26	93.20
TOTAL RAINFALL	(mm)=	112.17	112.17	112.17
RUNOFF COEFFICIENT	=	0.99	0.55	0.83

***** 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	ID= 1 DT=12.0 min

STANDHYD (0063)

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

				TOTALS
Max.Eff.Inten.	(mm/hr)=	126.49	80.66	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.92 (ii)	5.99 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	

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     PEAK FLOW       (cms)=       0.36          0.53          0.890 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=     111.17         61.26          75.24
     TOTAL RAINFALL   (mm)=     112.17        112.17         112.17
     RUNOFF COEFFICIENT   =       0.99          0.55           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.

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-------------------
| ADD HYD   (0007) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0004):     1.45   0.433    12.00    93.20
       + ID2= 2 (0005):     1.33   0.234    12.00    58.09
         ================================================
         ID = 3 (0007):     2.78   0.667    12.00    76.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0007) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0007):     2.78   0.667    12.00    76.68
       + ID2= 2 (0063):     3.62   0.890    12.00    75.24
         ================================================
         ID = 1 (0007):     6.40   1.556    12.00    76.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0033) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                         0.0000     0.0000    |   0.3260     0.8017
                         0.0790     0.1850    |   0.3960     0.9004
                         0.2270     0.3947    |   0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0007)   6.400     1.556     12.00      76.11
     OUTFLOW: ID= 1 (0033)   6.400     0.133     12.83      76.02

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.58
                TIME SHIFT OF PEAK FLOW         (min)= 50.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.2622

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| ROUTE PIPE (0034)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 850.00
-------------------      Slope      (m/m)=  0.005
                         Manning n     =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE    VELOCITY    TRAV.TIME
        (m)      (cu.m.)       (cms)        (m/s)        min
       0.09     .367E+02        0.0         0.80        17.68
       0.17     .102E+03        0.1         1.25        11.33
       0.26     .184E+03        0.3         1.61         8.81
       0.35     .278E+03        0.6         1.91         7.41
       0.43     .382E+03        1.0         2.18         6.51
       0.52     .492E+03        1.4         2.41         5.88
       0.61     .608E+03        1.9         2.61         5.43
       0.69     .727E+03        2.4         2.79         5.08
       0.78     .848E+03        2.9         2.95         4.81
       0.87     .970E+03        3.5         3.08         4.60
       0.96     .109E+04        4.1         3.20         4.43
       1.04     .121E+04        4.7         3.29         4.31
       1.13     .133E+04        5.2         3.36         4.22
       1.22     .144E+04        5.8         3.41         4.15
       1.30     .154E+04        6.2         3.44         4.12
       1.39     .163E+04        6.6         3.43         4.13
       1.48     .172E+04        6.9         3.40         4.17
       1.56     .178E+04        6.9         3.31         4.28
       1.65     .182E+04        6.5         3.02         4.70
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	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.13	12.83	76.02	0.16	1.16
OUTFLOW: ID= 1 (0034)	6.40	0.13	12.92	76.01	0.16	1.15

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| CALIB            |
| NASHYD    (0035) |   Area     (ha)=   8.03   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   1.394

     PEAK FLOW       (cms)=   1.100 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  56.403
     TOTAL RAINFALL   (mm)= 112.166
     RUNOFF COEFFICIENT   =   0.503

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (0037) |   Area     (ha)=  10.64   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.24

     Unit Hyd Qpeak  (cms)=   1.693

     PEAK FLOW       (cms)=   1.364 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  56.954
     TOTAL RAINFALL   (mm)= 112.166
     RUNOFF COEFFICIENT   =   0.508

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0038) |   Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.252 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  57.335
     TOTAL RAINFALL   (mm)= 112.166
     RUNOFF COEFFICIENT   =   0.511

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0036) |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       10.97          7.01
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      126.49         80.66
               over (min)        12.00         12.00
     Storage Coeff.  (min)=        0.92 (ii)     5.99 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        3.85          1.44          5.289 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=      111.17         61.26         91.70
     TOTAL RAINFALL   (mm)=      112.17        112.17        112.17
     RUNOFF COEFFICIENT   =        0.99          0.55          0.82
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***** 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 (0039) ID= 1 DT=12.0 min	Area (ha)= 1.21 Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00		
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.67	0.54	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	126.49	80.66	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.92 (ii)	5.99 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
		TOTALS	
PEAK FLOW (cms)=	0.23	0.11	0.345 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	111.17	61.26	88.71
TOTAL RAINFALL (mm)=	112.17	112.17	112.17
RUNOFF COEFFICIENT =	0.99	0.55	0.79

***** 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.

DUHYD (0074) Inlet Cap.=0.169 #of Inlets= 1 Total(cms)= 0.2	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.35	12.00	88.71
MAJOR SYS.(ID= 2):	0.14	0.18	12.00	88.71
MINOR SYS.(ID= 3):	1.07	0.17	12.00	88.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0047) ID= 1 DT=12.0 min	Area (ha)= 1.50 Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00		
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.96	0.54	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	126.49	80.66	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.92 (ii)	5.99 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
		TOTALS	
PEAK FLOW (cms)=	0.34	0.11	0.448 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	111.17	61.26	93.20
TOTAL RAINFALL (mm)=	112.17	112.17	112.17
RUNOFF COEFFICIENT =	0.99	0.55	0.83

***** 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.

DUHYD (0072) Inlet Cap.=0.363 #of Inlets= 1 Total(cms)= 0.4	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.45	12.00	93.20
MAJOR SYS.(ID= 2):	0.07	0.08	12.00	93.20
MINOR SYS.(ID= 3):	1.43	0.36	12.00	93.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0035):	8.03	1.100	12.00	56.40
+ ID2= 2 (0036):	17.98	5.289	12.00	91.70
ID = 3 (0040):	26.01	6.389	12.00	80.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	26.01	6.389	12.00	80.81
+ ID2= 2 (0037):	10.64	1.364	12.00	56.95
ID = 1 (0040):	36.65	7.753	12.00	73.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	36.65	7.753	12.00	73.88
+ ID2= 2 (0038):	2.11	0.252	12.00	57.34
ID = 3 (0040):	38.76	8.005	12.00	72.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	38.76	8.005	12.00	72.98
+ ID2= 2 (0072):	0.07	0.085	12.00	93.20
ID = 1 (0040):	38.83	8.090	12.00	73.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	38.83	8.090	12.00	73.01
+ ID2= 2 (0074):	0.14	0.176	12.00	88.71
ID = 3 (0040):	38.97	8.267	12.00	73.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041) 1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.

```
--------------------          (ha)     (cms)     (hrs)      (mm)
         ID1= 1 (0034):      6.40    0.133     12.92     76.01
      + ID2= 2 (0040):     38.97    8.267     12.00     73.07
        ================================================
        ID = 3 (0041):     45.37    8.313     12.00     73.80

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |       OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------        (cms)     (ha.m.)    |    (cms)     (ha.m.)
                            0.0000     0.0000    |   3.1150     0.9004
                            1.2740     0.5550    |   3.6250     1.1600
                            2.2650     0.7154    |   3.9640     1.3570

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (0041)      45.369     8.313     12.00      73.80
    OUTFLOW: ID= 1 (0043)      45.369     3.121     12.25      73.80

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 37.55
                  TIME SHIFT OF PEAK FLOW          (min)= 15.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.9055

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.10

    Unit Hyd Qpeak  (cms)=   1.253

    PEAK FLOW       (cms)=   0.431 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  36.889
    TOTAL RAINFALL   (mm)= 112.166
    RUNOFF COEFFICIENT   =   0.329

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

    Unit Hyd Qpeak  (cms)=   0.367

    PEAK FLOW       (cms)=   0.293 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  56.704
    TOTAL RAINFALL   (mm)= 112.166
    RUNOFF COEFFICIENT   =   0.506

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       6.71         3.45
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     126.49        80.66
              over (min)       12.00        12.00
    Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=      12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=       2.36         0.71          3.063 (iii)
    TIME TO PEAK    (hrs)=      12.00        12.00          12.00
    RUNOFF VOLUME    (mm)=     111.17        61.26          94.20
    TOTAL RAINFALL   (mm)=     112.17       112.17         112.17
    RUNOFF COEFFICIENT   =       0.99         0.55           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.

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--------------------
| CALIB            |
| STANDHYD  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       0.86         0.41
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     126.49        80.66
              over (min)       12.00        12.00
    Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=      12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=       0.30         0.08          0.387 (iii)
    TIME TO PEAK    (hrs)=      12.00        12.00          12.00
    RUNOFF VOLUME    (mm)=     111.17        61.26          95.20
    TOTAL RAINFALL   (mm)=     112.17       112.17         112.17
    RUNOFF COEFFICIENT   =       0.99         0.55           0.85

***** 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.

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--------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK     R.V.
--------------------       (ha)     (cms)     (hrs)     (mm)
    TOTAL HYD.(ID= 1):    1.27      0.39     12.00    95.20
    ================================================
    MAJOR SYS.(ID= 2):    0.05      0.07     12.00    95.20
    MINOR SYS.(ID= 3):    1.22      0.32     12.00    95.20

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0070) |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       1.38         1.12
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     126.49        80.66
              over (min)       12.00        12.00
    Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=      12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=       0.48         0.23          0.713 (iii)
    TIME TO PEAK    (hrs)=      12.00        12.00          12.00
    RUNOFF VOLUME    (mm)=     111.17        61.26          88.71
    TOTAL RAINFALL   (mm)=     112.17       112.17         112.17
    RUNOFF COEFFICIENT   =       0.99         0.55           0.79

***** 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.
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(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

DUHYD (0071)		AREA	QPEAK	TPEAK	R.V.
Inlet Cap.=0.550		(ha)	(cms)	(hrs)	(mm)
#of Inlets= 1	TOTAL HYD.(ID= 1):	2.50	0.71	12.00	88.71
Total(cms)= 0.6	MAJOR SYS.(ID= 2):	0.13	0.16	12.00	88.71
	MINOR SYS.(ID= 3):	2.37	0.55	12.00	88.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0044):	3.28	0.431	12.00	36.89
	+ ID2= 2 (0045):	10.16	3.063	12.00	94.20
	ID = 3 (0048):	13.44	3.494	12.00	80.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0048):	13.44	3.494	12.00	80.21
	+ ID2= 2 (0046):	2.21	0.293	12.00	56.70
	ID = 1 (0048):	15.65	3.787	12.00	76.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0048):	15.65	3.787	12.00	76.89
	+ ID2= 2 (0069):	1.22	0.320	12.00	95.20
	ID = 3 (0048):	16.87	4.107	12.00	78.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0048):	16.87	4.107	12.00	78.22
	+ ID2= 2 (0071):	2.37	0.550	12.00	88.71
	ID = 1 (0048):	19.24	4.657	12.00	79.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0048):	19.24	4.657	12.00	79.51
	+ ID2= 2 (0072):	1.43	0.363	12.00	93.20
	ID = 3 (0048):	20.67	5.020	12.00	80.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.9630	0.3823
	0.5430	0.1233	1.3030	0.6907
	0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.671	5.020	12.00	80.46
OUTFLOW: ID= 1 (0049)	20.671	1.131	12.30	80.45

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.53
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.5367

ROUTE PIPE (0050) IN= 2---> OUT= 1 DT= 5.0 min		
	PIPE Number	= 1.00
	Diameter (mm)	=1650.00
	Length (m)	= 467.00
	Slope (m/m)	= 0.006
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.67	1.13	12.30	80.45	0.45	2.41
OUTFLOW: ID= 1 (0050)	20.67	1.13	12.30	80.45	0.45	2.42

CALIB NASHYD (0054) ID= 1 DT=12.0 min				
	Area	(ha)= 1.34	Curve Number	(CN)= 74.0
	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.22		

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.184 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 56.402
TOTAL RAINFALL (mm)= 112.166
RUNOFF COEFFICIENT = 0.503

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0056) ID= 1 DT=12.0 min				
	Area	(ha)= 0.10	Curve Number	(CN)= 74.0
	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.05		

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 5.028
TOTAL RAINFALL (mm)= 112.166
RUNOFF COEFFICIENT = 0.045

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (0058) |   Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.290 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  57.482
     TOTAL RAINFALL   (mm)= 112.166
     RUNOFF COEFFICIENT   =   0.512

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0057) |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.33         0.14
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
                   over (min)     12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.12         0.03      0.144 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=    111.17        61.26      96.19
     TOTAL RAINFALL   (mm)=    112.17       112.17     112.17
     RUNOFF COEFFICIENT   =      0.99         0.55       0.86

***** 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.

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--------------------
| ADD HYD   (0073) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0057):     0.47   0.144    12.00    96.19
       + ID2= 2 (0058):     2.51   0.290    12.00    57.48
         ================================================
         ID = 3 (0073):     2.98   0.434    12.00    63.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| DUHYD     (0066) |
| Inlet Cap.=0.181 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |       AREA     QPEAK     TPEAK     R.V.
--------------------       (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.98      0.43     12.00    63.59
     ========================================================
     MAJOR SYS.(ID= 2):   0.42      0.25     12.00    63.59
     MINOR SYS.(ID= 3):   2.56      0.18     12.00    63.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0053) |   Area     (ha)=   5.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.28         2.58
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
                   over (min)     12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.15         0.53      1.681 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=    111.17        61.26      89.21
     TOTAL RAINFALL   (mm)=    112.17       112.17     112.17
     RUNOFF COEFFICIENT   =      0.99         0.55       0.80

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0055) |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.68         2.03
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
                   over (min)     12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.24         0.42      0.654 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=    111.17        61.26      73.74
     TOTAL RAINFALL   (mm)=    112.17       112.17     112.17
     RUNOFF COEFFICIENT   =      0.99         0.55       0.66

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0065) |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.68         2.03
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
                   over (min)     12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.24         0.42      0.654 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=    111.17        61.26      73.74
     TOTAL RAINFALL   (mm)=    112.17       112.17     112.17
     RUNOFF COEFFICIENT   =      0.99         0.55       0.66

***** 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
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THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0053):		5.86	1.681	12.00	89.21
+ ID2= 2 (0054):		1.34	0.184	12.00	56.40
ID = 3 (0051):		7.20	1.864	12.00	83.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 1 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		7.20	1.864	12.00	83.10
+ ID2= 2 (0055):		2.71	0.654	12.00	73.74
ID = 1 (0051):		9.91	2.519	12.00	80.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0051):		9.91	2.519	12.00	80.54
+ ID2= 2 (0056):		0.10	0.002	12.00	5.03
ID = 3 (0051):		10.01	2.520	12.00	79.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		10.01	2.520	12.00	79.79
+ ID2= 2 (0065):		2.71	0.654	12.00	73.74
ID = 1 (0051):		12.72	3.174	12.00	78.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0051):		12.72	3.174	12.00	78.50
+ ID2= 2 (0066):		2.56	0.181	12.00	63.59
ID = 3 (0051):		15.28	3.355	12.00	76.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		15.28	3.355	12.00	76.00
+ ID2= 2 (0069):		0.05	0.067	12.00	95.20
ID = 1 (0051):		15.33	3.422	12.00	76.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0050):		20.67	1.135	12.30	80.45
+ ID2= 2 (0051):		15.33	3.422	12.00	76.07
ID = 3 (0060):		36.00	4.315	12.00	78.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)					
IN= 2---> OUT= 1					
DT= 5.0 min		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	0.5100	0.3577
		0.2970	0.1233	0.6800	0.7154
		0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	35.999	4.315	12.00	78.60
OUTFLOW: ID= 1 (0061)	35.999	0.750	14.30	78.59

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.39
TIME SHIFT OF PEAK FLOW (min)=138.00
MAXIMUM STORAGE USED (ha.m.)= 1.0156

FINISH

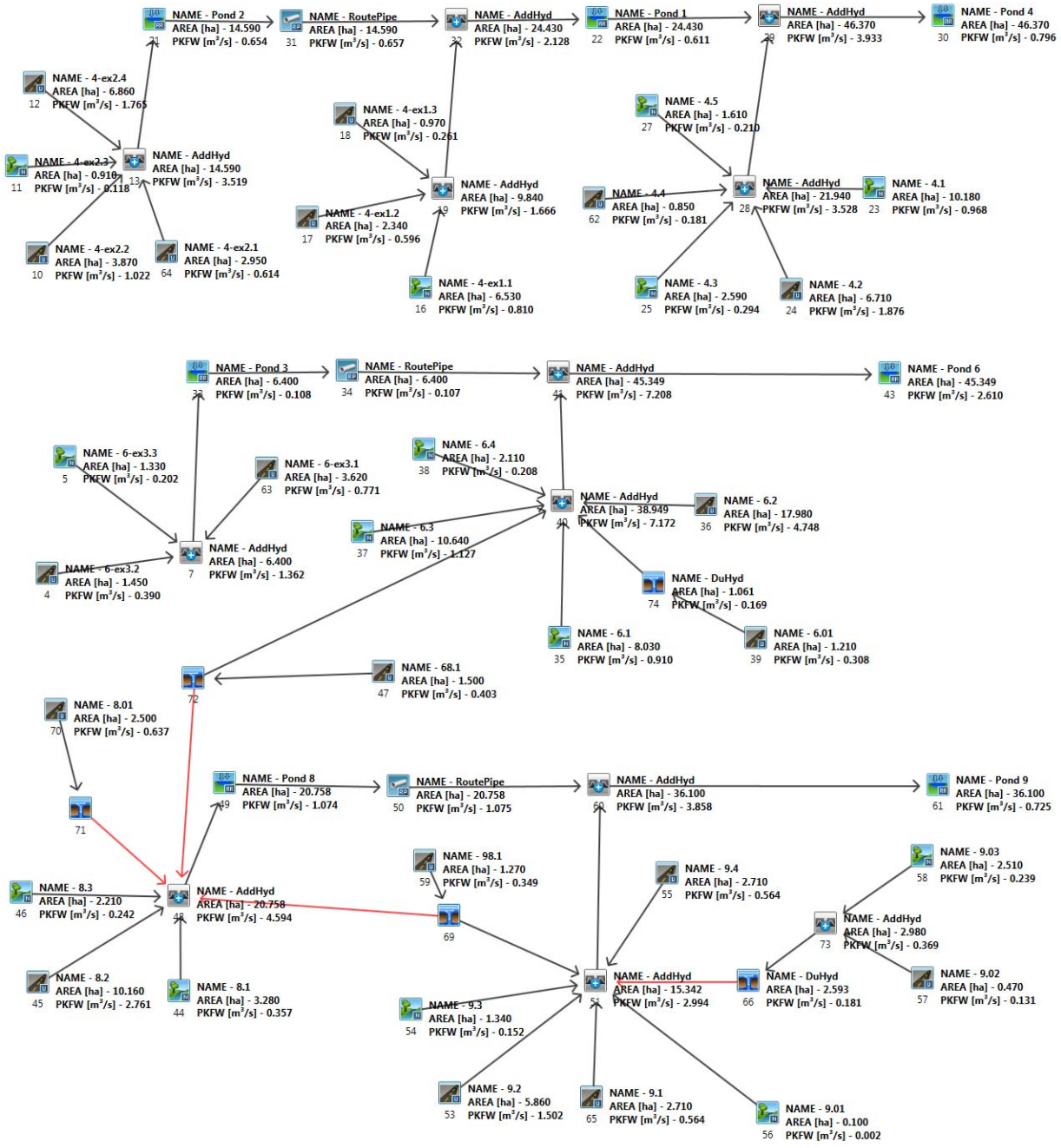
=====

COLE ENGINEERING

Experience Enhancing Excellence

L09-301
Glenway golf course development, Newmarket, ON
12 Hour SCS Type II Storm Pre-Development Model Schematic
July 2013

VO2 Model Schematic



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================================================================================================
=====

       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
         V V    I      SS   U   U  A   A  L
          VV    I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O    Company
        OOO     T      T    H   H    Y    M   M   OOO                Serial

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                    *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual Otthymo 3.0\VO2\voin.dat
  Output  filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2b35c34-fbac-4525-847e-
f59c2b644911\Scenario.out
  Summary filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2b35c34-fbac-4525-847e-
f59c2b644911\Scenario.sum

DATE: 07/26/2013                          TIME: 02:12:27

USER:


COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------------------------
-----
  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************


-------------------
|    READ STORM   |     Filename: C:\Users\DMcBrayne\AppD
|                 |               ata\Local\Temp\
|                 |               f2b35c34-fbac-4525-847e-f59c2b644911\9550c8f9
| Ptotal= 42.00 mm|    Comments: 2-Year 12-Hour SCS II Design Storm
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.25    1.05 |  3.25    1.68 |  6.25    7.56 |  9.25    1.47
               0.50    1.05 |  3.50    1.68 |  6.50    7.56 |  9.50    1.47
               0.75    1.05 |  3.75    1.68 |  6.75    3.36 |  9.75    1.47
               1.00    1.05 |  4.00    1.68 |  7.00    3.36 | 10.00    1.47
               1.25    1.05 |  4.25    2.52 |  7.25    2.52 | 10.25    0.84
               1.50    1.05 |  4.50    2.52 |  7.50    2.52 | 10.50    0.84
               1.75    1.05 |  4.75    3.36 |  7.75    2.52 | 10.75    0.84
               2.00    1.05 |  5.00    3.36 |  8.00    2.52 | 11.00    0.84
               2.25    1.26 |  5.25    5.04 |  8.25    1.47 | 11.25    0.84
               2.50    1.26 |  5.50    5.04 |  8.50    1.47 | 11.50    0.84
               2.75    1.26 |  5.75   20.16 |  8.75    1.47 | 11.75    0.84
               3.00    1.26 |  6.00   55.44 |  9.00    1.47 | 12.00    0.84

--------------------------------------------------------------------------------

-------------------
| CALIB           |
| NASHYD   (0011) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min|   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

        NOTE:  RAINFALL WAS TRANSFORMED TO  12.0 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
               0.200    1.05 | 3.200    1.68 | 6.200    7.56 |  9.20    1.47
               0.400    1.05 | 3.400    1.68 | 6.400    7.56 |  9.40    1.47
               0.600    1.05 | 3.600    1.68 | 6.600    5.46 |  9.60    1.47
               0.800    1.05 | 3.800    1.68 | 6.800    3.36 |  9.80    1.47
               1.000    1.05 | 4.000    1.68 | 7.000    3.36 | 10.00    1.47
               1.200    1.05 | 4.200    2.52 | 7.200    2.52 | 10.20    0.84
               1.400    1.05 | 4.400    2.52 | 7.400    2.52 | 10.40    0.84
               1.600    1.05 | 4.600    2.94 | 7.600    2.52 | 10.60    0.84
               1.800    1.05 | 4.800    3.36 | 7.800    2.52 | 10.80    0.84
               2.000    1.05 | 5.000    3.36 | 8.000    2.52 | 11.00    0.84
               2.200    1.26 | 5.200    5.04 | 8.200    1.47 | 11.20    0.84
               2.400    1.26 | 5.400    5.04 | 8.400    1.47 | 11.40    0.84
               2.600    1.26 | 5.600   12.60 | 8.600    1.47 | 11.60    0.84
               2.800    1.26 | 5.800   28.98 | 8.800    1.47 | 11.80    0.84
               3.000    1.26 | 6.000   55.44 | 9.000    1.47 | 12.00    0.84

     Unit Hyd Qpeak  (cms)=   0.204

     PEAK FLOW       (cms)=   0.031 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=   9.926
     TOTAL RAINFALL   (mm)=  42.000
     RUNOFF COEFFICIENT   =   0.236

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (0010) |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min|   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.36          1.51
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      55.44         19.90
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.28 (ii)    10.16 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.36          0.07          0.429 (iii)
     TIME TO PEAK    (hrs)=       6.00          6.00          6.00
     RUNOFF VOLUME    (mm)=      41.00         12.64         29.94
     TOTAL RAINFALL   (mm)=      42.00         42.00         42.00
     RUNOFF COEFFICIENT   =       0.98          0.30          0.71

***** 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 (0012) |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min|   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.18          2.68
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=     213.85         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      55.44         19.90
               over (min)        12.00         24.00
     Storage Coeff.  (min)=       4.15 (ii)    13.03 (ii)
     Unit Hyd. Tpeak (min)=      12.00         24.00
     Unit Hyd. peak  (cms)=       0.13          0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.63          0.09          0.690 (iii)
     TIME TO PEAK    (hrs)=       6.00          6.20          6.00
     RUNOFF VOLUME    (mm)=      41.00         12.64         29.94
     TOTAL RAINFALL   (mm)=      42.00         42.00         42.00
     RUNOFF COEFFICIENT   =       0.98          0.30          0.71

***** 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  (0064)     |   Area    (ha)=   2.95
|ID= 1 DT=12.0 min     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.74	2.21
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	55.44	19.90
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	0.209 (iii)
TIME TO PEAK	(hrs)=	6.00
RUNOFF VOLUME	(mm)=	19.73
TOTAL RAINFALL	(mm)=	42.00
RUNOFF COEFFICIENT	=	0.47

***** 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   (0013)     |
|   1 +  2 =  3        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.429	6.00	29.94
+ ID2= 2 (0011):	0.91	0.031	6.00	9.93
ID = 3 (0013):	4.78	0.460	6.00	26.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0013)     |
|   3 +  2 =  1        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	0.460	6.00	26.13
+ ID2= 2 (0012):	6.86	0.690	6.00	29.94
ID = 1 (0013):	11.64	1.150	6.00	28.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0013)     |
|   1 +  2 =  3        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	1.150	6.00	28.37
+ ID2= 2 (0064):	2.95	0.209	6.00	19.73
ID = 3 (0013):	14.59	1.359	6.00	26.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| RESERVOIR (0021)     |
| IN= 2---> OUT= 1     |
| DT=  5.0 min         |
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	1.359	6.00	26.63
OUTFLOW: ID= 1 (0021)	14.590	0.306	6.30	26.61
PEAK FLOW REDUCTION [Qout/Qin](%)=				22.55
TIME SHIFT OF PEAK FLOW (min)=				18.00
MAXIMUM STORAGE USED (ha.m.)=				0.1868

```
| ROUTE PIPE (0031)    |
| IN= 2---> OUT= 1     |
| DT=  5.0 min         |
```

PIPE Number	=	1.00
Diameter	(mm)=	1650.00
Length	(m)=	500.00
Slope	(m/m)=	0.005
Manning n	=	0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.31	6.30	26.61	0.24	1.52
OUTFLOW: ID= 1 (0031)	14.59	0.31	6.40	26.61	0.24	1.52

```
| CALIB                |
| NASHYD    (0016)     |   Area    (ha)=   6.53   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
```
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak	(cms)=	1.313
PEAK FLOW	(cms)=	0.212 (i)
TIME TO PEAK	(hrs)=	6.000
RUNOFF VOLUME	(mm)=	10.208
TOTAL RAINFALL	(mm)=	42.000
RUNOFF COEFFICIENT	=	0.243

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB                |
| STANDHYD  (0018)     |   Area    (ha)=   0.97
|ID= 1 DT=12.0 min     |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	55.44	19.90
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	0.111 (iii)
TIME TO PEAK	(hrs)=	6.00
RUNOFF VOLUME	(mm)=	30.79
TOTAL RAINFALL	(mm)=	42.00
RUNOFF COEFFICIENT	=	0.73

***** 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 (0017) ID= 1 DT=12.0 min	Area (ha)= 2.34 Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.29	1.05	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	55.44	19.90	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.28 (ii)	10.16 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.10	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.05	0.244 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	41.00	12.64	28.24
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	0.30	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 (0019) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.212	6.00	10.21
+ ID2= 2 (0017):	2.34	0.244	6.00	28.24
ID = 3 (0019):	8.87	0.456	6.00	14.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	0.456	6.00	14.96
+ ID2= 2 (0018):	0.97	0.111	6.00	30.79
ID = 1 (0019):	9.84	0.566	6.00	16.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	0.566	6.00	16.52
+ ID2= 2 (0031):	14.59	0.307	6.40	26.61
ID = 3 (0032):	24.43	0.706	6.00	22.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.6510	0.4564
	0.1220	0.0863	0.8770	0.7894
	0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	0.706	6.00	22.55
OUTFLOW: ID= 1 (0022)	24.430	0.298	7.00	22.54

PEAK FLOW REDUCTION [Qout/Qin](%)= 42.21
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1406

CALIB NASHYD (0023) ID= 1 DT=12.0 min	Area (ha)= 10.18 Curve Number (CN)= 74.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 1.440

PEAK FLOW (cms)= 0.247 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.660
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.254

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0025) ID= 1 DT=12.0 min	Area (ha)= 2.59 Curve Number (CN)= 74.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.076 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.460
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.249

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0027) ID= 1 DT=12.0 min	Area (ha)= 1.61 Curve Number (CN)= 74.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 8.776
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.209

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0024) ID= 1 DT=12.0 min	Area (ha)= 6.71 Total Imp(%)= 71.00 Dir. Conn.(%)= 71.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.76	1.95	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	55.44	19.90	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.28 (ii)	10.16 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.10	
				TOTALS
PEAK FLOW	(cms)=	0.73	0.08	0.818 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	41.00	12.64	32.78
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	0.30	0.78

***** 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 (0062)	Area (ha)= 0.85		
ID= 1 DT=12.0 min	Total Imp(%)= 28.00	Dir. Conn.(%)= 28.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.24	0.61	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		55.44	19.90	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.28 (ii)	10.16 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.10	
				TOTALS
PEAK FLOW	(cms)=	0.04	0.03	0.063 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	41.00	12.64	20.57
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	0.30	0.49

***** 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 (0028)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0023):	10.18	0.247	6.00	10.66	
+ ID2= 2 (0024):	6.71	0.818	6.00	32.78	
ID = 3 (0028):	16.89	1.064	6.00	19.45	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0028):	16.89	1.064	6.00	19.45	
+ ID2= 2 (0025):	2.59	0.076	6.00	10.46	
ID = 1 (0028):	19.48	1.140	6.00	18.25	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0028):	19.48	1.140	6.00	18.25	
+ ID2= 2 (0027):	1.61	0.056	6.00	8.78	
ID = 3 (0028):	21.09	1.196	6.00	17.53	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	1.196	6.00	17.53
+ ID2= 2 (0062):	0.85	0.063	6.00	20.57
ID = 1 (0028):	21.94	1.259	6.00	17.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.298	7.00	22.54
+ ID2= 2 (0028):	21.94	1.259	6.00	17.65
ID = 3 (0029):	46.37	1.361	6.00	20.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.3030	1.3940
	0.4380	0.4440	1.5000	1.8008
	0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	1.361	6.00	20.25
OUTFLOW: ID= 1 (0030)	46.370	0.306	8.20	20.25

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.50
TIME SHIFT OF PEAK FLOW (min)=132.00
MAXIMUM STORAGE USED (ha.m.)= 0.3105

CALIB					
NASHYD (0005)	Area	(ha)=	1.33	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)=		0.13		

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	1.05	3.083	1.68	6.083	7.56	9.08	1.47
0.167	1.05	3.167	1.68	6.167	7.56	9.17	1.47
0.250	1.05	3.250	1.68	6.250	7.56	9.25	1.47
0.333	1.05	3.333	1.68	6.333	7.56	9.33	1.47
0.417	1.05	3.417	1.68	6.417	7.56	9.42	1.47
0.500	1.05	3.500	1.68	6.500	7.56	9.50	1.47
0.583	1.05	3.583	1.68	6.583	3.36	9.58	1.47
0.667	1.05	3.667	1.68	6.667	3.36	9.67	1.47
0.750	1.05	3.750	1.68	6.750	3.36	9.75	1.47
0.833	1.05	3.833	1.68	6.833	3.36	9.83	1.47
0.917	1.05	3.917	1.68	6.917	3.36	9.92	1.47
1.000	1.05	4.000	1.68	7.000	3.36	10.00	1.47
1.083	1.05	4.083	2.52	7.083	2.52	10.08	0.84
1.167	1.05	4.167	2.52	7.167	2.52	10.17	0.84
1.250	1.05	4.250	2.52	7.250	2.52	10.25	0.84
1.333	1.05	4.333	2.52	7.333	2.52	10.33	0.84
1.417	1.05	4.417	2.52	7.417	2.52	10.42	0.84
1.500	1.05	4.500	2.52	7.500	2.52	10.50	0.84
1.583	1.05	4.583	3.36	7.583	2.52	10.58	0.84
1.667	1.05	4.667	3.36	7.667	2.52	10.67	0.84
1.750	1.05	4.750	3.36	7.750	2.52	10.75	0.84
1.833	1.05	4.833	3.36	7.833	2.52	10.83	0.84
1.917	1.05	4.917	3.36	7.917	2.52	10.92	0.84
2.000	1.05	5.000	3.36	8.000	2.52	11.00	0.84
2.083	1.26	5.083	5.04	8.083	1.47	11.08	0.84
2.167	1.26	5.167	5.04	8.167	1.47	11.17	0.84
2.250	1.26	5.250	5.04	8.250	1.47	11.25	0.84
2.333	1.26	5.333	5.04	8.333	1.47	11.33	0.84
2.417	1.26	5.417	5.04	8.417	1.47	11.42	0.84
2.500	1.26	5.500	5.04	8.500	1.47	11.50	0.84
2.583	1.26	5.583	20.16	8.583	1.47	11.58	0.84
2.667	1.26	5.667	20.16	8.667	1.47	11.67	0.84
2.750	1.26	5.750	20.16	8.750	1.47	11.75	0.84

2.833	1.26	5.833	55.44	8.833	1.47	11.83	0.84
2.917	1.26	5.917	55.44	8.917	1.47	11.92	0.84
3.000	1.26	6.000	55.44	9.000	1.47	12.00	0.84

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.737
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.256

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.05	3.200	1.68	6.200	7.56	9.20	1.47
0.400	1.05	3.400	1.68	6.400	7.56	9.40	1.47
0.600	1.05	3.600	1.68	6.600	5.46	9.60	1.47
0.800	1.05	3.800	1.68	6.800	3.36	9.80	1.47
1.000	1.05	4.000	1.68	7.000	3.36	10.00	1.47
1.200	1.05	4.200	2.52	7.200	2.52	10.20	0.84
1.400	1.05	4.400	2.52	7.400	2.52	10.40	0.84
1.600	1.05	4.600	2.94	7.600	2.52	10.60	0.84
1.800	1.05	4.800	3.36	7.800	2.52	10.80	0.84
2.000	1.05	5.000	3.36	8.000	2.52	11.00	0.84
2.200	1.26	5.200	5.04	8.200	1.47	11.20	0.84
2.400	1.26	5.400	5.04	8.400	1.47	11.40	0.84
2.600	1.26	5.600	12.60	8.600	1.47	11.60	0.84
2.800	1.26	5.800	28.98	8.800	1.47	11.80	0.84
3.000	1.26	6.000	55.44	9.000	1.47	12.00	0.84

				TOTALS
Max.Eff.Inten.	(mm/hr)=	55.44	19.90	
	over (min)	12.00	12.00	
Storage Coeff.	(min)=	1.28 (ii)	10.16 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.10	
PEAK FLOW	(cms)=	0.14	0.02	0.165 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	41.00	12.64	30.79
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	0.30	0.73

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.	(mm/hr)=	55.44	19.90
	over (min)	12.00	12.00
Storage Coeff.	(min)=	1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

				TOTALS
PEAK FLOW	(cms)=	0.16	0.11	0.268 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	41.00	12.64	20.58
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	0.30	0.49

***** 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 (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.165	6.00	30.79
+ ID2= 2 (0005):	1.33	0.053	6.00	10.74
ID = 3 (0007):	2.78	0.219	6.00	21.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.219	6.00	21.30
+ ID2= 2 (0063):	3.62	0.268	6.00	20.58
ID = 1 (0007):	6.40	0.487	6.00	20.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.487	6.00	20.97
OUTFLOW: ID= 1 (0033)	6.400	0.036	7.08	20.87

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.43
TIME SHIFT OF PEAK FLOW (min)= 65.00
MAXIMUM STORAGE USED (ha.m.)= 0.0847

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15

1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.04	7.08	20.87	0.09	0.81
OUTFLOW: ID= 1 (0034)	6.40	0.04	7.50	20.87	0.09	0.80

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.236 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.460
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.249

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 0.290 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.562
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.251

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.633
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.253

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	10.97	7.01
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	55.44	19.90
over (min)	12.00	12.00
Storage Coeff. (min)=	1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

			TOTALS
PEAK FLOW (cms)=	1.69	0.30	1.991 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	41.00	12.64	29.94
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.98	0.30	0.71

***** 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 (0039)
ID= 1 DT=12.0 min

Area (ha)= 1.21
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.67	0.54
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	55.44	19.90
over (min)	12.00	12.00
Storage Coeff. (min)=	1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

			TOTALS
PEAK FLOW (cms)=	0.10	0.02	0.126 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	41.00	12.64	28.23
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.98	0.30	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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.13	6.00	28.23
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.21	0.13	6.00	28.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0047)
ID= 1 DT=12.0 min

Area (ha)= 1.50
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.96	0.54
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	55.44	19.90
over (min)	12.00	12.00
Storage Coeff. (min)=	1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

			TOTALS
PEAK FLOW (cms)=	0.15	0.02	0.171 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	41.00	12.64	30.79
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.98	0.30	0.73

***** 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.

DUHYD (0072)					
Inlet Cap.=0.363					
#of Inlets= 1					
Total(cms)= 0.4		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	TOTAL HYD.(ID= 1):	1.50	0.17	6.00	30.79
	MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
	MINOR SYS.(ID= 3):	1.50	0.17	6.00	30.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0035):	8.03	0.236	6.00	10.46
+	ID2= 2 (0036):	17.98	1.991	6.00	29.94
	ID = 3 (0040):	26.01	2.227	6.00	23.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0040):	26.01	2.227	6.00	23.93
+	ID2= 2 (0037):	10.64	0.290	6.00	10.56
	ID = 1 (0040):	36.65	2.517	6.00	20.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0040):	36.65	2.517	6.00	20.05
+	ID2= 2 (0038):	2.11	0.053	6.00	10.63
	ID = 3 (0040):	38.76	2.571	6.00	19.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003

	ID1= 3 (0040):	38.76	2.571	6.00	19.53
+	ID2= 2 (0072):	0.00	0.000	0.00	0.00
	ID = 1 (0040):	38.76	2.571	6.00	19.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0074 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001

	ID1= 1 (0040):	38.76	2.571	6.00	19.53
+	ID2= 2 (0074):	0.00	0.000	0.00	0.00
	ID = 3 (0040):	38.76	2.571	6.00	19.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0034):	6.40	0.036	7.50	20.87
+	ID2= 2 (0040):	38.76	2.571	6.00	19.53
	ID = 3 (0041):	45.16	2.584	6.00	19.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0043)				
IN= 2---> OUT= 1				
DT= 5.0 min		OUTFLOW	STORAGE	OUTFLOW STORAGE
		(cms)	(ha.m.)	(cms) (ha.m.)
		0.0000	0.0000	3.1150 0.9004
		1.2740	0.5550	3.6250 1.1600
		2.2650	0.7154	3.9640 1.3570

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0041)	45.160	2.584	6.00	19.82
OUTFLOW: ID= 1 (0043)	45.160	0.697	6.33	19.82

PEAK FLOW REDUCTION [Qout/Qin](%)= 26.97
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.3036

CALIB				
NASHYD (0044)	Area	(ha)= 3.28	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.10		

Unit Hyd Qpeak (cms)= 1.253

PEAK FLOW (cms)= 0.096 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 6.841
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.163

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0046)	Area	(ha)= 2.21	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.23		

Unit Hyd Qpeak (cms)= 0.367

PEAK FLOW (cms)= 0.063 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.516
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.250

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0045)	Area	(ha)= 10.16		
ID= 1 DT=12.0 min	Total Imp(%)=	66.00	Dir. Conn.(%)=	66.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	6.71	3.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		55.44	19.90
over (min)		12.00	12.00
Storage Coeff. (min)=		1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00

```
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.03         0.15          1.182 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      41.00        12.64          31.36
     TOTAL RAINFALL   (mm)=      42.00        42.00          42.00
     RUNOFF COEFFICIENT   =       0.98         0.30           0.75

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0059) |   Area    (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.86         0.41
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      55.44        19.90
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.28 (ii)   10.16 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.02          0.151 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      41.00        12.64          31.92
     TOTAL RAINFALL   (mm)=      42.00        42.00          42.00
     RUNOFF COEFFICIENT   =       0.98         0.30           0.76

***** 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.

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--------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |
--------------------
                          AREA     QPEAK     TPEAK     R.V.
                           (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.27      0.15      6.00     31.92
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00      0.00
     MINOR SYS.(ID= 3):   1.27      0.15      6.00     31.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0070) |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.38         1.12
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      55.44        19.90
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.28 (ii)   10.16 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.05          0.260 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      41.00        12.64          28.24
     TOTAL RAINFALL   (mm)=      42.00        42.00          42.00
     RUNOFF COEFFICIENT   =       0.98         0.30           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.

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--------------------
| DUHYD     (0071) |
| Inlet Cap.=0.550 |
| #of Inlets=    1 |
| Total(cms)=  0.6 |
--------------------
                          AREA     QPEAK     TPEAK     R.V.
                           (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.50      0.26      6.00     28.24
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00      0.00
     MINOR SYS.(ID= 3):   2.50      0.26      6.00     28.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |
--------------------          AREA     QPEAK     TPEAK      R.V.
                               (ha)     (cms)     (hrs)      (mm)
          ID1= 1 (0044):      3.28     0.096      6.00      6.84
        + ID2= 2 (0045):     10.16     1.182      6.00     31.36
          ================================================
          ID = 3 (0048):     13.44     1.278      6.00     25.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |
--------------------          AREA     QPEAK     TPEAK      R.V.
                               (ha)     (cms)     (hrs)      (mm)
          ID1= 3 (0048):     13.44     1.278      6.00     25.37
        + ID2= 2 (0046):      2.21     0.063      6.00     10.52
          ================================================
          ID = 1 (0048):     15.65     1.340      6.00     23.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |
--------------------          AREA     QPEAK     TPEAK      R.V.
                               (ha)     (cms)     (hrs)      (mm)
          ID1= 1 (0048):     15.65     1.340      6.00     23.28
        + ID2= 2 (0069):      1.27     0.151      6.00     31.92
          ================================================
          ID = 3 (0048):     16.92     1.491      6.00     23.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |
--------------------          AREA     QPEAK     TPEAK      R.V.
                               (ha)     (cms)     (hrs)      (mm)
          ID1= 3 (0048):     16.92     1.491      6.00     23.93
        + ID2= 2 (0071):      2.50     0.260      6.00     28.24
          ================================================
          ID = 1 (0048):     19.42     1.751      6.00     24.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |
--------------------          AREA     QPEAK     TPEAK      R.V.
                               (ha)     (cms)     (hrs)      (mm)
          ID1= 1 (0048):     19.42     1.751      6.00     24.48
        + ID2= 2 (0072):      1.50     0.171      6.00     30.79
          ================================================
          ID = 3 (0048):     20.92     1.922      6.00     24.93
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.9630	0.3823
0.5430	0.1233	1.3030	0.6907
0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.920	1.922	6.00	24.93
OUTFLOW: ID= 1 (0049)	20.920	0.650	6.20	24.93

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.83
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.1817

ROUTE PIPE (0050)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 467.00
Slope (m/m)= 0.006
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.92	0.65	6.20	24.93	0.34	2.05
OUTFLOW: ID= 1 (0050)	20.92	0.65	6.20	24.93	0.34	2.05

CALIB
NASHYD (0054)
ID= 1 DT=12.0 min

Area (ha)= 1.34 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.039 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.460
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.249

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0056)
ID= 1 DT=12.0 min

Area (ha)= 0.10 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.000 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 0.933
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.022

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0058)
ID= 1 DT=12.0 min

Area (ha)= 2.51 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.061 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 10.660
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.254

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0057)
ID= 1 DT=12.0 min

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.33	0.14
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	55.44	19.90
over (min)	12.00	12.00
Storage Coeff. (min)=	1.28 (ii)	10.16 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

			TOTALS
PEAK FLOW (cms)=	0.05	0.01	0.057 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	41.00	12.64	32.48
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.98	0.30	0.77

***** 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 AN.

ADD HYD (0073)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.057	6.00	32.48
+ ID2= 2 (0058):	2.51	0.061	6.00	10.66
ID = 3 (0073):	2.98	0.118	6.00	14.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066)
Inlet Cap.=0.181
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.12	6.00	14.10
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.98	0.12	6.00	14.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| CALIB                                |
| STANDHYD  (0053)  |   Area    (ha)=   5.86
|ID= 1 DT=12.0 min  |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.28         2.58
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     55.44        19.90
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.28 (ii)   10.16 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.51         0.11          0.616 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=     41.00        12.64          28.52
     TOTAL RAINFALL   (mm)=     42.00        42.00          42.00
     RUNOFF COEFFICIENT   =      0.98         0.30           0.68

***** 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  (0055)  |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.68         2.03
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     55.44        19.90
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.28 (ii)   10.16 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.10         0.09          0.192 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=     41.00        12.64          19.73
     TOTAL RAINFALL   (mm)=     42.00        42.00          42.00
     RUNOFF COEFFICIENT   =      0.98         0.30           0.47

***** 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  (0065)  |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.68         2.03
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     55.44        19.90
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.28 (ii)   10.16 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.10         0.09          0.192 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=     41.00        12.64          19.73
     TOTAL RAINFALL   (mm)=     42.00        42.00          42.00
     RUNOFF COEFFICIENT   =      0.98         0.30           0.47

***** 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   (0051)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0053):     5.86   0.616     6.00    28.52
        + ID2= 2 (0054):     1.34   0.039     6.00    10.46
          ================================================
          ID = 3 (0051):     7.20   0.656     6.00    25.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0051)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0051):     7.20   0.656     6.00    25.16
        + ID2= 2 (0055):     2.71   0.192     6.00    19.73
          ================================================
          ID = 1 (0051):     9.91   0.848     6.00    23.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0051)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0051):     9.91   0.848     6.00    23.67
        + ID2= 2 (0056):     0.10   0.000     6.00     0.93
          ================================================
          ID = 3 (0051):    10.01   0.848     6.00    23.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0051)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0051):    10.01   0.848     6.00    23.45
        + ID2= 2 (0065):     2.71   0.192     6.00    19.73
          ================================================
          ID = 1 (0051):    12.72   1.040     6.00    22.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0051)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0051):    12.72   1.040     6.00    22.66
        + ID2= 2 (0066):     2.98   0.118     6.00    14.10
          ================================================
          ID = 3 (0051):    15.70   1.158     6.00    21.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0051)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0051):    15.70   1.158     6.00    21.03
```

+ ID2= 2 (0069):	0.00	0.000	0.00	0.00
ID = 1 (0051):	15.70	1.158	6.00	21.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0050):	20.92	0.653	6.20	24.93
+ ID2= 2 (0051):	15.70	1.158	6.00	21.03
ID = 3 (0060):	36.62	1.657	6.00	23.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.5100	0.3577
0.2970	0.1233	0.6800	0.7154
0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.620	1.657	6.00	23.26
OUTFLOW: ID= 1 (0061)	36.620	0.476	7.10	23.26

PEAK FLOW REDUCTION [Qout/Qin](%)= 28.72
TIME SHIFT OF PEAK FLOW (min)= 66.00
MAXIMUM STORAGE USED (ha.m.)= 0.3034

****
** SIMULATION NUMBER: 2 **
****

READ STORM
Ptotal= 54.40 mm

Filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2b35c34-fbac-4525-847e-f59c2b644911\60c8ba75
Comments: 5-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.36	3.25	2.18	6.25	9.79	9.25	1.90
0.50	1.36	3.50	2.18	6.50	9.79	9.50	1.90
0.75	1.36	3.75	2.18	6.75	4.35	9.75	1.90
1.00	1.36	4.00	2.18	7.00	4.35	10.00	1.90
1.25	1.36	4.25	3.26	7.25	3.26	10.25	1.09
1.50	1.36	4.50	3.26	7.50	3.26	10.50	1.09
1.75	1.36	4.75	4.35	7.75	3.26	10.75	1.09
2.00	1.36	5.00	4.35	8.00	3.26	11.00	1.09
2.25	1.63	5.25	6.53	8.25	1.90	11.25	1.09
2.50	1.63	5.50	6.53	8.50	1.90	11.50	1.09
2.75	1.63	5.75	26.11	8.75	1.90	11.75	1.09
3.00	1.63	6.00	71.81	9.00	1.90	12.00	1.09

CALIB
NASHYD (0011)
ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.36	3.200	2.18	6.200	9.79	9.20	1.90
0.400	1.36	3.400	2.18	6.400	9.79	9.40	1.90
0.600	1.36	3.600	2.18	6.600	7.07	9.60	1.90
0.800	1.36	3.800	2.18	6.800	4.35	9.80	1.90
1.000	1.36	4.000	2.18	7.000	4.35	10.00	1.90
1.200	1.36	4.200	3.26	7.200	3.26	10.20	1.09
1.400	1.36	4.400	3.26	7.400	3.26	10.40	1.09
1.600	1.36	4.600	3.81	7.600	3.26	10.60	1.09
1.800	1.36	4.800	4.35	7.800	3.26	10.80	1.09
2.000	1.36	5.000	4.35	8.000	3.26	11.00	1.09
2.200	1.63	5.200	6.53	8.200	1.90	11.20	1.09
2.400	1.63	5.400	6.53	8.400	1.90	11.40	1.09
2.600	1.63	5.600	16.32	8.600	1.90	11.60	1.09
2.800	1.63	5.800	37.54	8.800	1.90	11.80	1.09
3.000	1.63	6.000	71.81	9.000	1.90	12.00	1.09

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.051 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 16.111
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.296

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0010)
ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.36	1.51
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	71.81	31.03
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

		TOTALS
PEAK FLOW	(cms)=	0.579 (iii)
TIME TO PEAK	(hrs)=	6.00
RUNOFF VOLUME	(mm)=	40.25
TOTAL RAINFALL	(mm)=	54.40
RUNOFF COEFFICIENT	=	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.

CALIB
STANDHYD (0012)
ID= 1 DT=12.0 min

Area (ha)= 6.86
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.18	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	213.85	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	71.81	31.03
over	(min)	12.00	12.00
Storage Coeff.	(min)=	3.74 (ii)	11.17 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.09

		TOTALS
PEAK FLOW	(cms)=	0.992 (iii)
TIME TO PEAK	(hrs)=	6.00
RUNOFF VOLUME	(mm)=	40.25
TOTAL RAINFALL	(mm)=	54.40
RUNOFF COEFFICIENT	=	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.

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-------------------
| CALIB           |
| STANDHYD  (0064)|   Area    (ha)=   2.95
|ID= 1 DT=12.0 min|   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.74         2.21
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     71.81        31.03
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.15 (ii)    8.59 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.15         0.16          0.305 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00          6.00
     RUNOFF VOLUME    (mm)=     53.40        19.69         28.11
     TOTAL RAINFALL   (mm)=     54.40        54.40         54.40
     RUNOFF COEFFICIENT   =      0.98         0.36          0.52

***** 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   (0013)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0010):     3.87   0.579     6.00    40.25
       + ID2= 2 (0011):     0.91   0.051     6.00    16.11
         ================================================
         ID = 3 (0013):     4.78   0.630     6.00    35.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD   (0013)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0013):     4.78   0.630     6.00    35.66
       + ID2= 2 (0012):     6.86   0.992     6.00    40.25
         ================================================
         ID = 1 (0013):    11.64   1.622     6.00    38.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD   (0013)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):    11.64   1.622     6.00    38.36
       + ID2= 2 (0064):     2.95   0.305     6.00    28.11
         ================================================
         ID = 3 (0013):    14.59   1.927     6.00    36.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| RESERVOIR (0021)|
| IN= 2---> OUT= 1|
| DT=  5.0 min    |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                        0.0000     0.0000     |   0.6510     0.4563
                        0.1220     0.1110     |   0.8770     0.7650
                        0.3620     0.2096     |   0.0000     0.0000

                             AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0013)   14.590     1.927     6.00      36.29
     OUTFLOW: ID= 1 (0021)   14.590     0.414     6.20      36.28

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 21.49
                    TIME SHIFT OF PEAK FLOW         (min)= 12.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.2545
```

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-------------------
| ROUTE PIPE (0031)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 500.00
-------------------      Slope      (m/m)=  0.005
                         Manning n        =  0.013

     <------------------ TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)     (cu.m.)       (cms)         (m/s)        min
        0.09    .216E+02         0.0          0.80        10.40
        0.17    .600E+02         0.1          1.25         6.67
        0.26    .108E+03         0.3          1.61         5.18
        0.35    .164E+03         0.6          1.91         4.36
        0.43    .225E+03         1.0          2.18         3.83
        0.52    .290E+03         1.4          2.41         3.46
        0.61    .358E+03         1.9          2.61         3.19
        0.69    .428E+03         2.4          2.79         2.99
        0.78    .499E+03         2.9          2.95         2.83
        0.87    .570E+03         3.5          3.08         2.70
        0.96    .642E+03         4.1          3.20         2.61
        1.04    .712E+03         4.7          3.29         2.53
        1.13    .780E+03         5.2          3.36         2.48
        1.22    .844E+03         5.8          3.41         2.44
        1.30    .905E+03         6.2          3.44         2.43
        1.39    .961E+03         6.6          3.43         2.43
        1.48    .101E+04         6.9          3.40         2.45
        1.56    .105E+04         6.9          3.31         2.52
        1.65    .107E+04         6.5          3.02         2.76
                                          <---- hydrograph ---->   <-pipe / channel->
                             AREA     QPEAK     TPEAK     R.V.    MAX DEPTH   MAX VEL
                              (ha)     (cms)     (hrs)     (mm)        (m)       (m/s)
     INFLOW : ID= 2 (0021)   14.59      0.41      6.20    36.28       0.28       1.67
     OUTFLOW: ID= 1 (0031)   14.59      0.41      6.30    36.27       0.28       1.67
```

```
-------------------
| CALIB           |
| NASHYD    (0016)|   Area    (ha)=   6.53   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min|   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   1.313

     PEAK FLOW       (cms)=   0.348 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  16.569
     TOTAL RAINFALL   (mm)=  54.400
     RUNOFF COEFFICIENT   =   0.305

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

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-------------------
| CALIB           |
| STANDHYD  (0018)|   Area    (ha)=   0.97
|ID= 1 DT=12.0 min|   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.62         0.35
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     71.81        31.03
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.15 (ii)    8.59 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.12         0.02          0.149 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00          6.00
     RUNOFF VOLUME    (mm)=     53.40        19.69         41.26
     TOTAL RAINFALL   (mm)=     54.40        54.40         54.40
     RUNOFF COEFFICIENT   =      0.98         0.36          0.76

***** 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 (0017) ID= 1 DT=12.0 min	Area (ha)= 2.34	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.29	1.05
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	71.81	31.03
over (min)	12.00	12.00
Storage Coeff. (min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

			TOTALS
PEAK FLOW (cms)=	0.26	0.08	0.332 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	53.40	19.69	38.23
TOTAL RAINFALL (mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT =	0.98	0.36	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 (0019) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.348	6.00	16.57
+ ID2= 2 (0017):	2.34	0.332	6.00	38.23
ID = 3 (0019):	8.87	0.680	6.00	22.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019) | 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	0.680	6.00	22.28
+ ID2= 2 (0018):	0.97	0.149	6.00	41.26
ID = 1 (0019):	9.84	0.829	6.00	24.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	0.829	6.00	24.15
+ ID2= 2 (0031):	14.59	0.414	6.30	36.27
ID = 3 (0032):	24.43	1.076	6.00	31.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022) | IN= 2---> OUT= 1 | DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	1.076	6.00	31.39
OUTFLOW: ID= 1 (0022)	24.430	0.401	7.20	31.39

```
PEAK   FLOW   REDUCTION [Qout/Qin](%)= 37.25
TIME SHIFT OF PEAK FLOW          (min)= 72.00
MAXIMUM  STORAGE   USED        (ha.m.)=  0.2001
```

CALIB NASHYD (0023) ID= 1 DT=12.0 min | Area (ha)= 10.18 | Ia (mm)= 5.00 | U.H. Tp(hrs)= 0.27 | Curve Number (CN)= 74.0 | # of Linear Res.(N)= 3.00

```
Unit Hyd Qpeak  (cms)=   1.440

PEAK FLOW       (cms)=   0.410 (i)
TIME TO PEAK    (hrs)=   6.000
RUNOFF VOLUME    (mm)=  17.303
TOTAL RAINFALL   (mm)=  54.400
RUNOFF COEFFICIENT   =   0.318

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB NASHYD (0025) ID= 1 DT=12.0 min | Area (ha)= 2.59 | Ia (mm)= 5.00 | U.H. Tp(hrs)= 0.22 | Curve Number (CN)= 74.0 | # of Linear Res.(N)= 3.00

```
Unit Hyd Qpeak  (cms)=   0.450

PEAK FLOW       (cms)=   0.126 (i)
TIME TO PEAK    (hrs)=   6.000
RUNOFF VOLUME    (mm)=  16.979
TOTAL RAINFALL   (mm)=  54.400
RUNOFF COEFFICIENT   =   0.312

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB NASHYD (0027) ID= 1 DT=12.0 min | Area (ha)= 1.61 | Ia (mm)= 5.00 | U.H. Tp(hrs)= 0.13 | Curve Number (CN)= 74.0 | # of Linear Res.(N)= 3.00

```
Unit Hyd Qpeak  (cms)=   0.473

PEAK FLOW       (cms)=   0.091 (i)
TIME TO PEAK    (hrs)=   6.000
RUNOFF VOLUME    (mm)=  14.244
TOTAL RAINFALL   (mm)=  54.400
RUNOFF COEFFICIENT   =   0.262

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB STANDHYD (0024) ID= 1 DT=12.0 min | Area (ha)= 6.71 | Total Imp(%)= 71.00 | Dir. Conn.(%)= 71.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	4.76	1.95
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	71.81	31.03
over (min)	12.00	12.00
Storage Coeff. (min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

			TOTALS
PEAK FLOW (cms)=	0.95	0.14	1.089 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	53.40	19.69	43.62
TOTAL RAINFALL (mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT =	0.98	0.36	0.80

***** 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 (0062)
ID= 1 DT=12.0 min

Area (ha)= 0.85
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.24	0.61	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	71.81	31.03	
over (min)		12.00	12.00	
Storage Coeff. (min)	=	1.15 (ii)	8.59 (ii)	
Unit Hyd. Tpeak (min)	=	12.00	12.00	
Unit Hyd. peak (cms)	=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.05	0.04	0.091 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	29.12
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.54

***** 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 (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	0.410	6.00	17.30
+ ID2= 2 (0024):	6.71	1.089	6.00	43.62
ID = 3 (0028):	16.89	1.499	6.00	27.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	1.499	6.00	27.76
+ ID2= 2 (0025):	2.59	0.126	6.00	16.98
ID = 1 (0028):	19.48	1.625	6.00	26.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	1.625	6.00	26.33
+ ID2= 2 (0027):	1.61	0.091	6.00	14.24
ID = 3 (0028):	21.09	1.716	6.00	25.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	1.716	6.00	25.40
+ ID2= 2 (0062):	0.85	0.091	6.00	29.12
ID = 1 (0028):	21.94	1.807	6.00	25.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.401	7.20	31.39
+ ID2= 2 (0028):	21.94	1.807	6.00	25.55
ID = 3 (0029):	46.37	1.987	6.00	28.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	1.987	6.00	28.66
OUTFLOW: ID= 1 (0030)	46.370	0.447	8.40	28.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.49
TIME SHIFT OF PEAK FLOW (min)=144.00
MAXIMUM STORAGE USED (ha.m.)= 0.4529

CALIB
NASHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	1.36	3.083	2.18	6.083	9.79	9.08	1.90
0.167	1.36	3.167	2.18	6.167	9.79	9.17	1.90
0.250	1.36	3.250	2.18	6.250	9.79	9.25	1.90
0.333	1.36	3.333	2.18	6.333	9.79	9.33	1.90
0.417	1.36	3.417	2.18	6.417	9.79	9.42	1.90
0.500	1.36	3.500	2.18	6.500	9.79	9.50	1.90
0.583	1.36	3.583	2.18	6.583	4.35	9.58	1.90
0.667	1.36	3.667	2.18	6.667	4.35	9.67	1.90
0.750	1.36	3.750	2.18	6.750	4.35	9.75	1.90
0.833	1.36	3.833	2.18	6.833	4.35	9.83	1.90
0.917	1.36	3.917	2.18	6.917	4.35	9.92	1.90
1.000	1.36	4.000	2.18	7.000	4.35	10.00	1.90
1.083	1.36	4.083	3.26	7.083	3.26	10.08	1.09
1.167	1.36	4.167	3.26	7.167	3.26	10.17	1.09
1.250	1.36	4.250	3.26	7.250	3.26	10.25	1.09
1.333	1.36	4.333	3.26	7.333	3.26	10.33	1.09
1.417	1.36	4.417	3.26	7.417	3.26	10.42	1.09
1.500	1.36	4.500	3.26	7.500	3.26	10.50	1.09
1.583	1.36	4.583	4.35	7.583	3.26	10.58	1.09
1.667	1.36	4.667	4.35	7.667	3.26	10.67	1.09
1.750	1.36	4.750	4.35	7.750	3.26	10.75	1.09
1.833	1.36	4.833	4.35	7.833	3.26	10.83	1.09
1.917	1.36	4.917	4.35	7.917	3.26	10.92	1.09
2.000	1.36	5.000	4.35	8.000	3.26	11.00	1.09
2.083	1.63	5.083	6.53	8.083	1.90	11.08	1.09
2.167	1.63	5.167	6.53	8.167	1.90	11.17	1.09
2.250	1.63	5.250	6.53	8.250	1.90	11.25	1.09
2.333	1.63	5.333	6.53	8.333	1.90	11.33	1.09
2.417	1.63	5.417	6.53	8.417	1.90	11.42	1.09
2.500	1.63	5.500	6.53	8.500	1.90	11.50	1.09
2.583	1.63	5.583	26.11	8.583	1.90	11.58	1.09
2.667	1.63	5.667	26.11	8.667	1.90	11.67	1.09
2.750	1.63	5.750	26.11	8.750	1.90	11.75	1.09
2.833	1.63	5.833	71.81	8.833	1.90	11.83	1.09

2.917	1.63	5.917	71.81	8.917	1.90	11.92	1.09
3.000	1.63	6.000	71.81	9.000	1.90	12.00	1.09

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.087 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 17.427
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.320

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.36	3.200	2.18	6.200	9.79	9.20	1.90
0.400	1.36	3.400	2.18	6.400	9.79	9.40	1.90
0.600	1.36	3.600	2.18	6.600	7.07	9.60	1.90
0.800	1.36	3.800	2.18	6.800	4.35	9.80	1.90
1.000	1.36	4.000	2.18	7.000	4.35	10.00	1.90
1.200	1.36	4.200	3.26	7.200	3.26	10.20	1.09
1.400	1.36	4.400	3.26	7.400	3.26	10.40	1.09
1.600	1.36	4.600	3.81	7.600	3.26	10.60	1.09
1.800	1.36	4.800	4.35	7.800	3.26	10.80	1.09
2.000	1.36	5.000	4.35	8.000	3.26	11.00	1.09
2.200	1.63	5.200	6.53	8.200	1.90	11.20	1.09
2.400	1.63	5.400	6.53	8.400	1.90	11.40	1.09
2.600	1.63	5.600	16.32	8.600	1.90	11.60	1.09
2.800	1.63	5.800	37.54	8.800	1.90	11.80	1.09
3.000	1.63	6.000	71.81	9.000	1.90	12.00	1.09

				TOTALS
Max.Eff.Inten.	(mm/hr)=	71.81	31.03	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
PEAK FLOW	(cms)=	0.19	0.04	0.222 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	41.26
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.76

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.	(mm/hr)=	71.81	31.03
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.20	0.19	0.389 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	29.12
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.54

***** 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 (0007)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):		1.45	0.222	6.00	41.26
+ ID2= 2 (0005):		1.33	0.087	6.00	17.43
ID = 3 (0007):		2.78	0.310	6.00	30.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):		2.78	0.310	6.00	30.00
+ ID2= 2 (0063):		3.62	0.389	6.00	29.12
ID = 1 (0007):		6.40	0.698	6.00	29.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.698	6.00	29.62
OUTFLOW: ID= 1 (0033)	6.400	0.051	7.00	29.52

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.33
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1199

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12

1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.05	7.00	29.52	0.10	0.84
OUTFLOW: ID= 1 (0034)	6.40	0.05	7.42	29.52	0.10	0.84

CALIB NASHYD (0035) ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.389 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 16.979
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.312

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0037) ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 0.480 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 17.144
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.315

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0038) ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.088 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 17.259
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.317

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0036) ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	10.97	7.01
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	71.81	31.03
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	2.19	0.50	2.689 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	40.25
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	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.

CALIB STANDHYD (0039) ID= 1 DT=12.0 min

Area (ha)= 1.21
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.67	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	71.81	31.03
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.13	0.04	0.172 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	38.22
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.17	6.00	38.22
MAJOR SYS.(ID= 2):	0.01	0.00	6.00	38.22
MINOR SYS.(ID= 3):	1.20	0.17	6.00	38.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0047) ID= 1 DT=12.0 min

Area (ha)= 1.50
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.96	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	71.81	31.03
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.19	0.04	0.230 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	41.26
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.76

***** 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

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      THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| DUHYD     (0072) |
| Inlet Cap.=0.363 |
| #of Inlets=    1 |
| Total(cms)=  0.4 |       AREA     QPEAK     TPEAK     R.V.
--------------------       (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.50      0.23      6.00    41.26
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   1.50      0.23      6.00    41.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0035):     8.03   0.389     6.00     16.98
        + ID2= 2 (0036):    17.98   2.689     6.00     40.25
          ================================================
          ID = 3 (0040):    26.01   3.078     6.00     33.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0040):    26.01   3.078     6.00     33.07
        + ID2= 2 (0037):    10.64   0.480     6.00     17.14
          ================================================
          ID = 1 (0040):    36.65   3.558     6.00     28.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0040):    36.65   3.558     6.00     28.44
        + ID2= 2 (0038):     2.11   0.088     6.00     17.26
          ================================================
          ID = 3 (0040):    38.76   3.646     6.00     27.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0040):    38.76   3.646     6.00     27.84
        + ID2= 2 (0072):     0.00   0.000     0.00      0.00
          ================================================
          ID = 1 (0040):    38.76   3.646     6.00     27.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0040):    38.76   3.646     6.00     27.84
        + ID2= 2 (0074):     0.01   0.003     6.00     38.22
          ================================================
          ID = 3 (0040):    38.77   3.649     6.00     27.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0041) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0034):     6.40   0.051     7.42     29.52
        + ID2= 2 (0040):    38.77   3.649     6.00     27.84
          ================================================
          ID = 3 (0041):    45.17   3.667     6.00     28.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)    |    (cms)     (ha.m.)
                           0.0000     0.0000    |   3.1150      0.9004
                           1.2740     0.5550    |   3.6250      1.1600
                           2.2650     0.7154    |   3.9640      1.3570

                                 AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0041)      45.165     3.667      6.00      28.21
     OUTFLOW: ID= 1 (0043)      45.165     0.996      6.33      28.21

               PEAK   FLOW   REDUCTION [Qout/Qin](%)= 27.16
               TIME SHIFT OF PEAK FLOW          (min)= 20.00
               MAXIMUM  STORAGE   USED       (ha.m.)=  0.4344

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.156 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  11.104
     TOTAL RAINFALL   (mm)=  54.400
     RUNOFF COEFFICIENT   =   0.204

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.103 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  17.069
     TOTAL RAINFALL   (mm)=  54.400
     RUNOFF COEFFICIENT   =   0.314

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71          3.45
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n             =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=      71.81         31.03
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.15 (ii)     8.59 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.34          0.25          1.585 (iii)
     TIME TO PEAK    (hrs)=       6.00          6.00           6.00
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```
     RUNOFF VOLUME     (mm)=      53.40        19.69          41.94
     TOTAL RAINFALL    (mm)=      54.40        54.40          54.40
     RUNOFF COEFFICIENT   =       0.98         0.36           0.77

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0059) |   Area    (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.86         0.41
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      71.81        31.03
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.15 (ii)    8.59 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.03          0.201 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      53.40        19.69          42.61
     TOTAL RAINFALL   (mm)=      54.40        54.40          54.40
     RUNOFF COEFFICIENT   =       0.98         0.36           0.78

***** 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.

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--------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.27      0.20      6.00   42.61
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   1.27      0.20      6.00   42.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0070) |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.38         1.12
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      71.81        31.03
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.15 (ii)    8.59 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.08          0.355 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      53.40        19.69          38.23
     TOTAL RAINFALL   (mm)=      54.40        54.40          54.40
     RUNOFF COEFFICIENT   =       0.98         0.36           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.

--------------------------------------------------------------------------------
--------------------
| DUHYD     (0071) |
| Inlet Cap.=0.550 |
| #of Inlets=    1 |
| Total(cms)=  0.6 |       AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.50      0.35      6.00   38.23
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   2.50      0.35      6.00   38.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28    0.156     6.00    11.10
        + ID2= 2 (0045):    10.16    1.585     6.00    41.94
          ================================================
          ID = 3 (0048):    13.44    1.741     6.00    34.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44    1.741     6.00    34.41
        + ID2= 2 (0046):     2.21    0.103     6.00    17.07
          ================================================
          ID = 1 (0048):    15.65    1.844     6.00    31.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65    1.844     6.00    31.96
        + ID2= 2 (0069):     1.27    0.201     6.00    42.61
          ================================================
          ID = 3 (0048):    16.92    2.045     6.00    32.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.92    2.045     6.00    32.76
        + ID2= 2 (0071):     2.50    0.355     6.00    38.23
          ================================================
          ID = 1 (0048):    19.42    2.400     6.00    33.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.42    2.400     6.00    33.47
        + ID2= 2 (0072):     1.50    0.230     6.00    41.26
          ================================================
          ID = 3 (0048):    20.92    2.630     6.00    34.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0049) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |
-------------------
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.9630	0.3823
0.5430	0.1233	1.3030	0.6907
0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.920	2.630	6.00	34.02
OUTFLOW: ID= 1 (0049)	20.920	0.788	6.20	34.02

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.96
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.2559

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-------------------
| ROUTE PIPE (0050)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |
-------------------
```

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 467.00
Slope (m/m)= 0.006
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.92	0.79	6.20	34.02	0.37	2.16
OUTFLOW: ID= 1 (0050)	20.92	0.79	6.20	34.02	0.37	2.16

```
-------------------
| CALIB            |
| NASHYD    (0054) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 1.34 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.065 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 16.978
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.312

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-------------------
| CALIB            |
| NASHYD    (0056) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 0.10 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 1.514
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.028

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0058) |
|ID= 1 DT=12.0 min |
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Area (ha)= 2.51 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.101 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 17.303
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.318

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0057) |
|ID= 1 DT=12.0 min |
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```

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.33	0.14
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	71.81	31.03
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.07	0.01	0.076 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	43.27
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.80

***** 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.

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-------------------
| ADD HYD   (0073) |
|  1 +  2 =  3     |
-------------------
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	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.076	6.00	43.27
+ ID2= 2 (0058):	2.51	0.101	6.00	17.30
ID = 3 (0073):	2.98	0.177	6.00	21.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| DUHYD     (0066) |
| Inlet Cap.=0.181 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.18	6.00	21.40
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.98	0.18	6.00	21.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0053) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 5.86
Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.28	2.58	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	71.81	31.03	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.65	0.18	0.839 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	38.57
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.71

***** 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 (0055)
ID= 1 DT=12.0 min

Area (ha)= 2.71
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	71.81	31.03	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.14	0.15	0.280 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	28.11
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.52

***** 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 (0065)
ID= 1 DT=12.0 min

Area (ha)= 2.71
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	71.81	31.03	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.15 (ii)	8.59 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.14	0.15	0.280 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	53.40	19.69	28.11
TOTAL RAINFALL	(mm)=	54.40	54.40	54.40
RUNOFF COEFFICIENT	=	0.98	0.36	0.52

***** 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 (0051)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0053):		5.86	0.839	6.00	38.57
+ ID2= 2 (0054):		1.34	0.065	6.00	16.98
ID = 3 (0051):		7.20	0.904	6.00	34.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):		7.20	0.904	6.00	34.55
+ ID2= 2 (0055):		2.71	0.280	6.00	28.11
ID = 1 (0051):		9.91	1.184	6.00	32.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0051):		9.91	1.184	6.00	32.79
+ ID2= 2 (0056):		0.10	0.001	6.00	1.51
ID = 3 (0051):		10.01	1.185	6.00	32.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):		10.01	1.185	6.00	32.48
+ ID2= 2 (0065):		2.71	0.280	6.00	28.11
ID = 1 (0051):		12.72	1.466	6.00	31.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0051):		12.72	1.466	6.00	31.55
+ ID2= 2 (0066):		2.98	0.177	6.00	21.40
ID = 3 (0051):		15.70	1.642	6.00	29.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0069 <ID= 2> IS DRY.					
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003					
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003					
ID1= 3 (0051):		15.70	1.642	6.00	29.62
+ ID2= 2 (0069):		0.00	0.000	0.00	0.00
ID = 1 (0051):		15.70	1.642	6.00	29.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0050):	20.92	0.788	6.20	34.02
	+ ID2= 2 (0051):	15.70	1.642	6.00	29.62
	ID = 3 (0060):	36.62	2.268	6.00	32.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1	0.0000	0.0000	0.5100	0.3577
DT= 5.0 min	0.2970	0.1233	0.6800	0.7154
	0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.620	2.268	6.00	32.14
OUTFLOW: ID= 1 (0061)	36.620	0.553	7.40	32.14

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.39
TIME SHIFT OF PEAK FLOW (min)= 84.00
MAXIMUM STORAGE USED (ha.m.)= 0.4487

****
** SIMULATION NUMBER: 3 **
****

READ STORM	Filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2b35c34-fbac-4525-847e-f59c2b644911\a2d2cdd1
Ptotal= 62.70 mm	Comments: 10-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.57	3.25	2.51	6.25	11.29	9.25	2.19
0.50	1.57	3.50	2.51	6.50	11.29	9.50	2.19
0.75	1.57	3.75	2.51	6.75	5.02	9.75	2.19
1.00	1.57	4.00	2.51	7.00	5.02	10.00	2.19
1.25	1.57	4.25	3.76	7.25	3.76	10.25	1.25
1.50	1.57	4.50	3.76	7.50	3.76	10.50	1.25
1.75	1.57	4.75	5.02	7.75	3.76	10.75	1.25
2.00	1.57	5.00	5.02	8.00	3.76	11.00	1.25
2.25	1.88	5.25	7.52	8.25	2.19	11.25	1.25
2.50	1.88	5.50	7.52	8.50	2.19	11.50	1.25
2.75	1.88	5.75	30.10	8.75	2.19	11.75	1.25
3.00	1.88	6.00	82.76	9.00	2.19	12.00	1.25

CALIB	Area (ha)= 0.91	Curve Number (CN)= 74.0
NASHYD (0011)	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
ID= 1 DT=12.0 min	U.H. Tp(hrs)= 0.17	

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.57	3.200	2.51	6.200	11.29	9.20	2.19
0.400	1.57	3.400	2.51	6.400	11.29	9.40	2.19
0.600	1.57	3.600	2.51	6.600	8.15	9.60	2.19
0.800	1.57	3.800	2.51	6.800	5.02	9.80	2.19
1.000	1.57	4.000	2.51	7.000	5.02	10.00	2.19
1.200	1.57	4.200	3.76	7.200	3.76	10.20	1.25
1.400	1.57	4.400	3.76	7.400	3.76	10.40	1.25
1.600	1.57	4.600	4.39	7.600	3.76	10.60	1.25
1.800	1.57	4.800	5.02	7.800	3.76	10.80	1.25
2.000	1.57	5.000	5.02	8.000	3.76	11.00	1.25
2.200	1.88	5.200	7.52	8.200	2.19	11.20	1.25
2.400	1.88	5.400	7.52	8.400	2.19	11.40	1.25
2.600	1.88	5.600	18.81	8.600	2.19	11.60	1.25
2.800	1.88	5.800	43.26	8.800	2.19	11.80	1.25
3.000	1.88	6.000	82.76	9.000	2.19	12.00	1.25

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.066 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 20.738
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.331

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 3.87
STANDHYD (0010)	Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00
ID= 1 DT=12.0 min	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.36	1.51
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	82.76	39.25
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.09 (ii)	7.86 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.54	0.14	0.683 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	47.35
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.76

***** 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	Area (ha)= 6.86
STANDHYD (0012)	Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00
ID= 1 DT=12.0 min	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.18	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	213.85	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	82.76	39.25
over	(min)	12.00	12.00
Storage Coeff.	(min)=	3.53 (ii)	10.30 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

				TOTALS
PEAK FLOW	(cms)=	0.95	0.23	1.174 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	47.35
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.76

***** 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	Area (ha)= 2.95
STANDHYD (0064)	Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00
ID= 1 DT=12.0 min	

```
                                  IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=        0.74          2.21
     Dep. Storage      (mm)=        1.00          1.50
     Average Slope      (%)=        2.00          2.00
     Length             (m)=       30.00         20.00
     Mannings n            =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=       82.76         39.25
                 over (min)       12.00         12.00
     Storage Coeff.  (min)=        1.09 (ii)     7.86 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=        0.17          0.21      0.375 (iii)
     TIME TO PEAK    (hrs)=        6.00          6.00      6.00
     RUNOFF VOLUME    (mm)=       61.70         24.90     34.10
     TOTAL RAINFALL   (mm)=       62.70         62.70     62.70
     RUNOFF COEFFICIENT   =        0.98          0.40      0.54

***** 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 (0013)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0010):	3.87	0.683	6.00	47.35
	+ ID2= 2 (0011):	0.91	0.066	6.00	20.74
	ID = 3 (0013):	4.78	0.749	6.00	42.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0013):	4.78	0.749	6.00	42.28
	+ ID2= 2 (0012):	6.86	1.174	6.00	47.35
	ID = 1 (0013):	11.64	1.923	6.00	45.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0013):	11.64	1.923	6.00	45.27
	+ ID2= 2 (0064):	2.95	0.375	6.00	34.10
	ID = 3 (0013):	14.59	2.299	6.00	43.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	2.299	6.00	43.01
OUTFLOW: ID= 1 (0021)	14.590	0.470	6.30	42.99

```
     PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.46
     TIME SHIFT OF PEAK FLOW          (min)= 18.00
     MAXIMUM  STORAGE   USED        (ha.m.)=  0.3024
```

ROUTE PIPE (0031)
IN= 2---> OUT= 1
DT= 5.0 min

```
     PIPE Number      =   1.00
     Diameter    (mm)=1650.00
     Length       (m)= 500.00
     Slope      (m/m)=  0.005
     Manning n        =  0.013
```

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.47	6.30	42.99	0.30	1.73
OUTFLOW: ID= 1 (0031)	14.59	0.47	6.30	42.99	0.30	1.73

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

```
     Area     (ha)=   6.53   Curve Number    (CN)= 74.0
     Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
     U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   1.313

     PEAK FLOW       (cms)=   0.451 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  21.328
     TOTAL RAINFALL   (mm)=  62.700
     RUNOFF COEFFICIENT   =   0.340

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

```
     Area     (ha)=   0.97
     Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       0.62          0.35
     Dep. Storage      (mm)=       1.00          1.50
     Average Slope      (%)=       2.00          2.00
     Length             (m)=      30.00         20.00
     Mannings n            =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      82.76         39.25
                 over (min)      12.00         12.00
     Storage Coeff.  (min)=       1.09 (ii)     7.86 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.14          0.03      0.175 (iii)
     TIME TO PEAK    (hrs)=       6.00          6.00      6.00
     RUNOFF VOLUME    (mm)=      61.70         24.90     48.45
     TOTAL RAINFALL   (mm)=      62.70         62.70     62.70
     RUNOFF COEFFICIENT   =       0.98          0.40      0.77

***** 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.
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| CALIB                |
| STANDHYD  (0017)     |   Area    (ha)=   2.34
|ID= 1 DT=12.0 min     |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.29         1.05
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      82.76        39.25
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.09 (ii)    7.86 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.10          0.394 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      61.70        24.90          45.14
     TOTAL RAINFALL   (mm)=      62.70        62.70          62.70
     RUNOFF COEFFICIENT   =       0.98         0.40           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.

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-------------------
| ADD HYD   (0019) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0016):     6.53   0.451     6.00    21.33
       + ID2= 2 (0017):     2.34   0.394     6.00    45.14
         ================================================
         ID = 3 (0019):     8.87   0.845     6.00    27.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0019) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 3 (0019):     8.87   0.845     6.00    27.61
       + ID2= 2 (0018):     0.97   0.175     6.00    48.45
         ================================================
         ID = 1 (0019):     9.84   1.020     6.00    29.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0032) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0019):     9.84   1.020     6.00    29.66
       + ID2= 2 (0031):    14.59   0.470     6.30    42.99
         ================================================
         ID = 3 (0032):    24.43   1.329     6.00    37.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0022) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.6510     0.4564
                         0.1220     0.0863   |   0.8770     0.7894
                         0.3620     0.1603   |   0.0000     0.0000

                              AREA     QPEAK     TPEAK      R.V.
                              (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0032)   24.430     1.329      6.00      37.62

     OUTFLOW: ID= 1 (0022)   24.430     0.448      7.40      37.62

               PEAK   FLOW   REDUCTION [Qout/Qin](%)= 33.70
               TIME SHIFT OF PEAK FLOW          (min)= 84.00
               MAXIMUM  STORAGE   USED        (ha.m.)=  0.2482

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-------------------
| CALIB                |
| NASHYD    (0023)     |   Area    (ha)=  10.18   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------      U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   0.533 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  22.273
     TOTAL RAINFALL   (mm)=  62.700
     RUNOFF COEFFICIENT   =   0.355

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB                |
| NASHYD    (0025)     |   Area    (ha)=   2.59   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------      U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.163 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  21.855
     TOTAL RAINFALL   (mm)=  62.700
     RUNOFF COEFFICIENT   =   0.349

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB                |
| NASHYD    (0027)     |   Area    (ha)=   1.61   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------      U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.118 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  18.336
     TOTAL RAINFALL   (mm)=  62.700
     RUNOFF COEFFICIENT   =   0.292

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB                |
| STANDHYD  (0024)     |   Area    (ha)=   6.71
|ID= 1 DT=12.0 min     |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.76         1.95
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      82.76        39.25
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.09 (ii)    7.86 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.10         0.18          1.276 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      61.70        24.90          51.03
     TOTAL RAINFALL   (mm)=      62.70        62.70          62.70
     RUNOFF COEFFICIENT   =       0.98         0.40           0.81

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  74.0    Ia = Dep. Storage  (Above)
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(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0062) ID= 1 DT=12.0 min	Area (ha)= 0.85 Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.24	0.61	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	82.76	39.25	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.05	0.06	0.112 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	35.19
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.56

***** 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 (0028) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	0.533	6.00	22.27
+ ID2= 2 (0024):	6.71	1.276	6.00	51.03
ID = 3 (0028):	16.89	1.809	6.00	33.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	1.809	6.00	33.70
+ ID2= 2 (0025):	2.59	0.163	6.00	21.85
ID = 1 (0028):	19.48	1.972	6.00	32.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	1.972	6.00	32.12
+ ID2= 2 (0027):	1.61	0.118	6.00	18.34
ID = 3 (0028):	21.09	2.090	6.00	31.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	2.090	6.00	31.07
+ ID2= 2 (0062):	0.85	0.112	6.00	35.19
ID = 1 (0028):	21.94	2.201	6.00	31.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.448	7.40	37.62
+ ID2= 2 (0028):	21.94	2.201	6.00	31.23
ID = 3 (0029):	46.37	2.456	6.00	34.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.3030	1.3940
	0.4380	0.4440	1.5000	1.8008
	0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	2.456	6.00	34.63
OUTFLOW: ID= 1 (0030)	46.370	0.528	8.30	34.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.51
TIME SHIFT OF PEAK FLOW (min)=138.00
MAXIMUM STORAGE USED (ha.m.)= 0.5348

CALIB NASHYD (0005) ID= 1 DT= 5.0 min	Area (ha)= 1.33 Curve Number (CN)= 74.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.13

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	1.57	3.083	2.51	6.083	11.29	9.08	2.19
0.167	1.57	3.167	2.51	6.167	11.29	9.17	2.19
0.250	1.57	3.250	2.51	6.250	11.29	9.25	2.19
0.333	1.57	3.333	2.51	6.333	11.29	9.33	2.19
0.417	1.57	3.417	2.51	6.417	11.29	9.42	2.19
0.500	1.57	3.500	2.51	6.500	11.29	9.50	2.19
0.583	1.57	3.583	2.51	6.583	5.02	9.58	2.19
0.667	1.57	3.667	2.51	6.667	5.02	9.67	2.19
0.750	1.57	3.750	2.51	6.750	5.02	9.75	2.19
0.833	1.57	3.833	2.51	6.833	5.02	9.83	2.19
0.917	1.57	3.917	2.51	6.917	5.02	9.92	2.19
1.000	1.57	4.000	2.51	7.000	5.02	10.00	2.19
1.083	1.57	4.083	3.76	7.083	3.76	10.08	1.25
1.167	1.57	4.167	3.76	7.167	3.76	10.17	1.25
1.250	1.57	4.250	3.76	7.250	3.76	10.25	1.25
1.333	1.57	4.333	3.76	7.333	3.76	10.33	1.25
1.417	1.57	4.417	3.76	7.417	3.76	10.42	1.25
1.500	1.57	4.500	3.76	7.500	3.76	10.50	1.25
1.583	1.57	4.583	5.02	7.583	3.76	10.58	1.25
1.667	1.57	4.667	5.02	7.667	3.76	10.67	1.25
1.750	1.57	4.750	5.02	7.750	3.76	10.75	1.25
1.833	1.57	4.833	5.02	7.833	3.76	10.83	1.25
1.917	1.57	4.917	5.02	7.917	3.76	10.92	1.25
2.000	1.57	5.000	5.02	8.000	3.76	11.00	1.25
2.083	1.88	5.083	7.52	8.083	2.19	11.08	1.25
2.167	1.88	5.167	7.52	8.167	2.19	11.17	1.25
2.250	1.88	5.250	7.52	8.250	2.19	11.25	1.25
2.333	1.88	5.333	7.52	8.333	2.19	11.33	1.25
2.417	1.88	5.417	7.52	8.417	2.19	11.42	1.25
2.500	1.88	5.500	7.52	8.500	2.19	11.50	1.25
2.583	1.88	5.583	30.10	8.583	2.19	11.58	1.25
2.667	1.88	5.667	30.10	8.667	2.19	11.67	1.25
2.750	1.88	5.750	30.10	8.750	2.19	11.75	1.25
2.833	1.88	5.833	82.76	8.833	2.19	11.83	1.25
2.917	1.88	5.917	82.76	8.917	2.19	11.92	1.25
3.000	1.88	6.000	82.76	9.000	2.19	12.00	1.25

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW	(cms)=	0.113 (i)
TIME TO PEAK	(hrs)=	6.000
RUNOFF VOLUME	(mm)=	22.432
TOTAL RAINFALL	(mm)=	62.700
RUNOFF COEFFICIENT	=	0.358

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004) | Area (ha)= 1.45
ID= 1 DT=12.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.57	3.200	2.51	6.200	11.29	9.20	2.19
0.400	1.57	3.400	2.51	6.400	11.29	9.40	2.19
0.600	1.57	3.600	2.51	6.600	8.15	9.60	2.19
0.800	1.57	3.800	2.51	6.800	5.02	9.80	2.19
1.000	1.57	4.000	2.51	7.000	5.02	10.00	2.19
1.200	1.57	4.200	3.76	7.200	3.76	10.20	1.25
1.400	1.57	4.400	3.76	7.400	3.76	10.40	1.25
1.600	1.57	4.600	4.39	7.600	3.76	10.60	1.25
1.800	1.57	4.800	5.02	7.800	3.76	10.80	1.25
2.000	1.57	5.000	5.02	8.000	3.76	11.00	1.25
2.200	1.88	5.200	7.52	8.200	2.19	11.20	1.25
2.400	1.88	5.400	7.52	8.400	2.19	11.40	1.25
2.600	1.88	5.600	18.81	8.600	2.19	11.60	1.25
2.800	1.88	5.800	43.26	8.800	2.19	11.80	1.25
3.000	1.88	6.000	82.76	9.000	2.19	12.00	1.25

Max.Eff.Inten.(mm/hr)=		82.76	39.25	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.21	0.05	0.262 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	48.45
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.77

***** 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 (0063) | Area (ha)= 3.62
ID= 1 DT=12.0 min | Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=		82.76	39.25	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.23	0.24	0.476 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	35.20
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.56

***** 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 (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.262	6.00	48.45
+ ID2= 2 (0005):	1.33	0.113	6.00	22.43
ID = 3 (0007):	2.78	0.374	6.00	36.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.374	6.00	36.17
+ ID2= 2 (0063):	3.62	0.476	6.00	35.20
ID = 1 (0007):	6.40	0.850	6.00	35.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.850	6.00	35.76
OUTFLOW: ID= 1 (0033)	6.400	0.062	7.00	35.66

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.28
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1449

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number	=	1.00
Diameter	(mm)=	1650.00
Length	(m)=	850.00
Slope	(m/m)=	0.005
Manning n	=	0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.06	7.00	35.66	0.11	0.88
OUTFLOW: ID= 1 (0034)	6.40	0.06	7.33	35.66	0.11	0.87

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.504 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 21.855
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.349

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 0.623 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 22.068
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.352

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.115 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 22.216
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.354

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	10.97	7.01	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		82.76	39.25	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	2.52	0.65	3.174 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	47.35
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.76

***** 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 (0039)
ID= 1 DT=12.0 min

Area (ha)= 1.21
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		82.76	39.25	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.15	0.05	0.204 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	45.13
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.20	6.00	45.13
MAJOR SYS.(ID= 2):	0.06	0.03	6.00	45.13
MINOR SYS.(ID= 3):	1.15	0.17	6.00	45.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0047)
ID= 1 DT=12.0 min

Area (ha)= 1.50
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.96	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		82.76	39.25	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.22	0.05	0.271 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	48.45
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.77

***** 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.

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-------------------
| DUHYD     (0072) |
| Inlet Cap.=0.363 |
| #of Inlets=    1 |
| Total(cms)=  0.4 |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.27	6.00	48.45
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.50	0.27	6.00	48.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0035):	8.03	0.504	6.00	21.85
+ ID2= 2 (0036):	17.98	3.174	6.00	47.35
ID = 3 (0040):	26.01	3.679	6.00	39.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	26.01	3.679	6.00	39.48
+ ID2= 2 (0037):	10.64	0.623	6.00	22.07
ID = 1 (0040):	36.65	4.301	6.00	34.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	36.65	4.301	6.00	34.42
+ ID2= 2 (0038):	2.11	0.115	6.00	22.22
ID = 3 (0040):	38.76	4.416	6.00	33.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
*** W A R N I N G :  HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	38.76	4.416	6.00	33.76
+ ID2= 2 (0072):	0.00	0.000	0.00	0.00
ID = 1 (0040):	38.76	4.416	6.00	33.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	38.76	4.416	6.00	33.76
+ ID2= 2 (0074):	0.06	0.035	6.00	45.13
ID = 3 (0040):	38.82	4.451	6.00	33.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0041) |
|   1 +  2 =  3    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0034):	6.40	0.061	7.33	35.66
+ ID2= 2 (0040):	38.82	4.451	6.00	33.77
ID = 3 (0041):	45.22	4.473	6.00	34.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |
-------------------
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	3.1150	0.9004
1.2740	0.5550	3.6250	1.1600
2.2650	0.7154	3.9640	1.3570

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0041)	45.215	4.473	6.00	34.20
OUTFLOW: ID= 1 (0043)	45.215	1.215	6.33	34.20

PEAK FLOW REDUCTION [Qout/Qin](%)= 27.16
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.5302

```
-------------------
| CALIB            |
| NASHYD    (0044) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 3.28 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.10

Unit Hyd Qpeak (cms)= 1.253

PEAK FLOW (cms)= 0.201 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 14.294
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.228

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-------------------
| CALIB            |
| NASHYD    (0046) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 2.21 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.23

Unit Hyd Qpeak (cms)= 0.367

PEAK FLOW (cms)= 0.134 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 21.971
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.350

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-------------------
| CALIB            |
| STANDHYD  (0045) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 10.16
Total Imp(%)= 66.00 Dir. Conn.(%)= 66.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	6.71	3.45	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	82.76	39.25	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
			TOTALS
PEAK FLOW (cms)=	1.54	0.32	1.863 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	61.70	24.90	49.19
TOTAL RAINFALL (mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT =	0.98	0.40	0.78

***** 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 (0059) ID= 1 DT=12.0 min	Area (ha)= 1.27 Total Imp(%)= 68.00 Dir. Conn.(%)= 68.00		
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.86	0.41	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	82.76	39.25	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
		TOTALS	
PEAK FLOW (cms)=	0.20	0.04	0.236 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	61.70	24.90	49.92
TOTAL RAINFALL (mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT =	0.98	0.40	0.80

***** 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.

DUHYD (0069) Inlet Cap.=0.320 #of Inlets= 1 Total(cms)= 0.3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.24	6.00	49.92
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.27	0.24	6.00	49.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0070) ID= 1 DT=12.0 min	Area (ha)= 2.50 Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00		
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.38	1.12	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	82.76	39.25	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
		TOTALS	
PEAK FLOW (cms)=	0.32	0.10	0.421 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	61.70	24.90	45.14
TOTAL RAINFALL (mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT =	0.98	0.40	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.

DUHYD (0071) Inlet Cap.=0.550 #of Inlets= 1 Total(cms)= 0.6	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.50	0.42	6.00	45.14
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.50	0.42	6.00	45.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0044):	3.28	0.201	6.00	14.29
+ ID2= 2 (0045):	10.16	1.863	6.00	49.19
ID = 3 (0048):	13.44	2.064	6.00	40.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	13.44	2.064	6.00	40.67
+ ID2= 2 (0046):	2.21	0.134	6.00	21.97
ID = 1 (0048):	15.65	2.198	6.00	38.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0048):	15.65	2.198	6.00	38.03
+ ID2= 2 (0069):	1.27	0.236	6.00	49.92
ID = 3 (0048):	16.92	2.435	6.00	38.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	16.92	2.435	6.00	38.92
+ ID2= 2 (0071):	2.50	0.421	6.00	45.14
ID = 1 (0048):	19.42	2.855	6.00	39.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0048):	19.42	2.855	6.00	39.72
+ ID2= 2 (0072):	1.50	0.271	6.00	48.45
ID = 3 (0048):	20.92	3.126	6.00	40.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE

	(cms)	(ha.m.)		(cms)	(ha.m.)
	0.0000	0.0000		0.9630	0.3823
	0.5430	0.1233		1.3030	0.6907
	0.7650	0.2343		1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.920	3.126	6.00	40.35
OUTFLOW: ID= 1 (0049)	20.920	0.861	6.20	40.35

PEAK FLOW REDUCTION [Qout/Qin](%)= 27.55
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.3103

ROUTE PIPE (0050)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 467.00
Slope (m/m)= 0.006
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.92	0.86	6.20	40.35	0.39	2.22
OUTFLOW: ID= 1 (0050)	20.92	0.86	6.30	40.34	0.39	2.21

CALIB
NASHYD (0054)
ID= 1 DT=12.0 min

Area (ha)= 1.34 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.084 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 21.855
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.349

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0056)
ID= 1 DT=12.0 min

Area (ha)= 0.10 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 1.948
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.031

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0058)
ID= 1 DT=12.0 min

Area (ha)= 2.51 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.131 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 22.273
TOTAL RAINFALL (mm)= 62.700
RUNOFF COEFFICIENT = 0.355

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0057)
ID= 1 DT=12.0 min

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.33	0.14	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	82.76	39.25	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.09 (ii)	7.86 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.08	0.01	0.089 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	61.70	24.90	50.65
TOTAL RAINFALL	(mm)=	62.70	62.70	62.70
RUNOFF COEFFICIENT	=	0.98	0.40	0.81

***** 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 (0073)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.089	6.00	50.65
+ ID2= 2 (0058):	2.51	0.131	6.00	22.27
ID = 3 (0073):	2.98	0.220	6.00	26.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066)
Inlet Cap.=0.181
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.22	6.00	26.75
MAJOR SYS.(ID= 2):	0.11	0.04	6.00	26.75
MINOR SYS.(ID= 3):	2.87	0.18	6.00	26.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0053)
ID= 1 DT=12.0 min

Area (ha)= 5.86
Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.28	2.58
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00

```
     Length            (m)=      30.00        20.00
     Mannings n          =       0.013        0.250

     Max.Eff.Inten.(mm/hr)=      82.76        39.25
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.09 (ii)    7.86 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.75         0.24          0.994 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      61.70        24.90          45.51
     TOTAL RAINFALL   (mm)=      62.70        62.70          62.70
     RUNOFF COEFFICIENT   =       0.98         0.40           0.73

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0055) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       0.68         2.03
     Dep. Storage      (mm)=       1.00         1.50
     Average Slope      (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =       0.013        0.250

     Max.Eff.Inten.(mm/hr)=      82.76        39.25
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.09 (ii)    7.86 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.19          0.345 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      61.70        24.90          34.10
     TOTAL RAINFALL   (mm)=      62.70        62.70          62.70
     RUNOFF COEFFICIENT   =       0.98         0.40           0.54

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0065) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       0.68         2.03
     Dep. Storage      (mm)=       1.00         1.50
     Average Slope      (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =       0.013        0.250

     Max.Eff.Inten.(mm/hr)=      82.76        39.25
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.09 (ii)    7.86 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.19          0.345 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      61.70        24.90          34.10
     TOTAL RAINFALL   (mm)=      62.70        62.70          62.70
     RUNOFF COEFFICIENT   =       0.98         0.40           0.54

***** 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.

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| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0053):     5.86   0.994     6.00    45.51
        + ID2= 2 (0054):     1.34   0.084     6.00    21.85
          ================================================
          ID = 3 (0051):     7.20   1.079     6.00    41.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0051):     7.20   1.079     6.00    41.10
        + ID2= 2 (0055):     2.71   0.345     6.00    34.10
          ================================================
          ID = 1 (0051):     9.91   1.424     6.00    39.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0051):     9.91   1.424     6.00    39.19
        + ID2= 2 (0056):     0.10   0.001     6.00     1.95
          ================================================
          ID = 3 (0051):    10.01   1.424     6.00    38.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0051):    10.01   1.424     6.00    38.82
        + ID2= 2 (0065):     2.71   0.345     6.00    34.10
          ================================================
          ID = 1 (0051):    12.72   1.769     6.00    37.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0051):    12.72   1.769     6.00    37.81
        + ID2= 2 (0066):     2.87   0.181     6.00    26.75
          ================================================
          ID = 3 (0051):    15.59   1.950     6.00    35.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0051):    15.59   1.950     6.00    35.77
        + ID2= 2 (0069):     0.00   0.000     0.00     0.00
          ================================================
          ID = 1 (0051):    15.59   1.950     6.00    35.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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ADD HYD (0060)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0050):	20.92	0.858	6.30	40.34
	+ ID2= 2 (0051):	15.59	1.950	6.00	35.77
	ID = 3 (0060):	36.51	2.641	6.00	38.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1	0.0000	0.0000	0.5100	0.3577
DT= 5.0 min	0.2970	0.1233	0.6800	0.7154
	0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.515	2.641	6.00	38.40
OUTFLOW: ID= 1 (0061)	36.515	0.602	7.60	38.40

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.81
TIME SHIFT OF PEAK FLOW (min)= 96.00
MAXIMUM STORAGE USED (ha.m.)= 0.5521

****
** SIMULATION NUMBER: 4 **
****

READ STORM	Filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2b35c34-fbac-4525-847e-f59c2b644911\38e05848
Ptotal= 73.10 mm	Comments: 25-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.83	3.25	2.92	6.25	13.16	9.25	2.56
0.50	1.83	3.50	2.92	6.50	13.16	9.50	2.56
0.75	1.83	3.75	2.92	6.75	5.85	9.75	2.56
1.00	1.83	4.00	2.92	7.00	5.85	10.00	2.56
1.25	1.83	4.25	4.39	7.25	4.39	10.25	1.46
1.50	1.83	4.50	4.39	7.50	4.39	10.50	1.46
1.75	1.83	4.75	5.85	7.75	4.39	10.75	1.46
2.00	1.83	5.00	5.85	8.00	4.39	11.00	1.46
2.25	2.19	5.25	8.77	8.25	2.56	11.25	1.46
2.50	2.19	5.50	8.77	8.50	2.56	11.50	1.46
2.75	2.19	5.75	35.09	8.75	2.56	11.75	1.46
3.00	2.19	6.00	96.49	9.00	2.56	12.00	1.46

CALIB NASHYD (0011) ID= 1 DT=12.0 min	Area (ha)= 0.91	Curve Number (CN)= 74.0
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.17	

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.83	3.200	2.92	6.200	13.16	9.20	2.56
0.400	1.83	3.400	2.92	6.400	13.16	9.40	2.56
0.600	1.83	3.600	2.92	6.600	9.50	9.60	2.56
0.800	1.83	3.800	2.92	6.800	5.85	9.80	2.56
1.000	1.83	4.000	2.92	7.000	5.85	10.00	2.56
1.200	1.83	4.200	4.39	7.200	4.39	10.20	1.46
1.400	1.83	4.400	4.39	7.400	4.39	10.40	1.46
1.600	1.83	4.600	5.12	7.600	4.39	10.60	1.46
1.800	1.83	4.800	5.85	7.800	4.39	10.80	1.46
2.000	1.83	5.000	5.85	8.000	4.39	11.00	1.46
2.200	2.19	5.200	8.77	8.200	2.56	11.20	1.46
2.400	2.19	5.400	8.77	8.400	2.56	11.40	1.46
2.600	2.19	5.600	21.93	8.600	2.56	11.60	1.46
2.800	2.19	5.800	50.44	8.800	2.56	11.80	1.46
3.000	2.19	6.000	96.49	9.000	2.56	12.00	1.46

Unit Hyd Qpeak (cms)=	0.204	
PEAK FLOW (cms)=	0.086 (i)	
TIME TO PEAK (hrs)=	6.000	
RUNOFF VOLUME (mm)=	26.978	
TOTAL RAINFALL (mm)=	73.100	
RUNOFF COEFFICIENT =	0.369	

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0010) ID= 1 DT=12.0 min	Area (ha)= 3.87	Total Imp(%)= 61.00	Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.36	1.51	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		96.49	50.24	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.63	0.18	0.817 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	72.10	31.87	56.41
TOTAL RAINFALL	(mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT	=	0.99	0.44	0.77

***** 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 (0012) ID= 1 DT=12.0 min	Area (ha)= 6.86	Total Imp(%)= 61.00	Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	213.85	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		96.49	50.24	
over (min)		12.00	12.00	
Storage Coeff. (min)=		3.32 (ii)	9.45 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.10	
				TOTALS
PEAK FLOW	(cms)=	1.11	0.30	1.408 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	72.10	31.87	56.41
TOTAL RAINFALL	(mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT	=	0.99	0.44	0.77

***** 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 (0064) ID= 1 DT=12.0 min	Area (ha)= 2.95	Total Imp(%)= 25.00	Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.74	2.21
Dep. Storage	(mm)=	1.00	1.50

Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		96.49	50.24	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.27	0.468 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	72.10	31.87	41.93
TOTAL RAINFALL	(mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT	=	0.99	0.44	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 (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.817	6.00	56.41
+ ID2= 2 (0011):	0.91	0.086	6.00	26.98
ID = 3 (0013):	4.78	0.903	6.00	50.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	0.903	6.00	50.81
+ ID2= 2 (0012):	6.86	1.408	6.00	56.41
ID = 1 (0013):	11.64	2.312	6.00	54.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	2.312	6.00	54.11
+ ID2= 2 (0064):	2.95	0.468	6.00	41.93
ID = 3 (0013):	14.59	2.780	6.00	51.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	2.780	6.00	51.65
OUTFLOW: ID= 1 (0021)	14.590	0.543	6.30	51.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.54
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.3645

ROUTE PIPE (0031)
IN= 2---> OUT= 1

Pipe Number = 1.00
Diameter (mm)=1650.00
DT= 5.0 min
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.54	6.30	51.63	0.32	1.81
OUTFLOW: ID= 1 (0031)	14.59	0.54	6.30	51.63	0.32	1.81

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.589 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 27.745
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.380

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		96.49	50.24
over (min)		12.00	12.00
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12
			TOTALS
PEAK FLOW	(cms)=	0.17	0.04 0.209 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00 6.00
RUNOFF VOLUME	(mm)=	72.10	31.87 57.62
TOTAL RAINFALL	(mm)=	73.10	73.10 73.10
RUNOFF COEFFICIENT	=	0.99	0.44 0.79

***** 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

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| STANDHYD  (0017) |   Area     (ha)=   2.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
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                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.29         1.05
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      96.49        50.24
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.02 (ii)    7.15 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.34         0.13          0.474 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      72.10        31.87          54.00
     TOTAL RAINFALL   (mm)=      73.10        73.10          73.10
     RUNOFF COEFFICIENT   =       0.99         0.44           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.

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| ADD HYD   (0019) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0016):      6.53   0.589     6.00     27.75
       + ID2= 2 (0017):      2.34   0.474     6.00     54.00
         ================================================
         ID = 3 (0019):      8.87   1.063     6.00     34.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0019) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 3 (0019):      8.87   1.063     6.00     34.67
       + ID2= 2 (0018):      0.97   0.209     6.00     57.62
         ================================================
         ID = 1 (0019):      9.84   1.272     6.00     36.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0032) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0019):      9.84   1.272     6.00     36.93
       + ID2= 2 (0031):     14.59   0.544     6.30     51.63
         ================================================
         ID = 3 (0032):     24.43   1.654     6.00     45.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0022) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------        (cms)     (ha.m.)    |    (cms)     (ha.m.)
                           0.0000     0.0000    |   0.6510     0.4564
                           0.1220     0.0863    |   0.8770     0.7894
                           0.3620     0.1603    |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0032)     24.430     1.654      6.00      45.71
     OUTFLOW: ID= 1 (0022)     24.430     0.511      7.50      45.70

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 30.90
                   TIME SHIFT OF PEAK FLOW         (min)= 90.00

                        MAXIMUM  STORAGE   USED       (ha.m.)=  0.3131

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-------------------
| CALIB            |
| NASHYD   (0023)  |   Area     (ha)=  10.18   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   0.700 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  28.975
     TOTAL RAINFALL   (mm)=  73.100
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD   (0025)  |   Area     (ha)=   2.59   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.213 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  28.431
     TOTAL RAINFALL   (mm)=  73.100
     RUNOFF COEFFICIENT   =   0.389

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD   (0027)  |   Area     (ha)=   1.61   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.153 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  23.853
     TOTAL RAINFALL   (mm)=  73.100
     RUNOFF COEFFICIENT   =   0.326

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0024) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
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                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.76         1.95
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      96.49        50.24
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.02 (ii)    7.15 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.28         0.24          1.515 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      72.10        31.87          60.43
     TOTAL RAINFALL   (mm)=      73.10        73.10          73.10
     RUNOFF COEFFICIENT   =       0.99         0.44           0.83

***** 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.
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CALIB STANDHYD (0062) ID= 1 DT=12.0 min	Area (ha)= 0.85	Total Imp(%)= 28.00	Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		96.49	50.24
over (min)		12.00	12.00
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.06	0.07	0.139 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	72.10	31.87	43.13
TOTAL RAINFALL	(mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT	=	0.99	0.44	0.59

***** 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 (0028) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	0.700	6.00	28.98
+ ID2= 2 (0024):	6.71	1.515	6.00	60.43
ID = 3 (0028):	16.89	2.215	6.00	41.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	2.215	6.00	41.47
+ ID2= 2 (0025):	2.59	0.213	6.00	28.43
ID = 1 (0028):	19.48	2.428	6.00	39.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	2.428	6.00	39.74
+ ID2= 2 (0027):	1.61	0.153	6.00	23.85
ID = 3 (0028):	21.09	2.581	6.00	38.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	2.581	6.00	38.53
+ ID2= 2 (0062):	0.85	0.139	6.00	43.13
ID = 1 (0028):	21.94	2.720	6.00	38.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.511	7.50	45.70
+ ID2= 2 (0028):	21.94	2.720	6.00	38.70
ID = 3 (0029):	46.37	3.072	6.00	42.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	3.072	6.00	42.43
OUTFLOW: ID= 1 (0030)	46.370	0.633	8.20	42.43

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.62
TIME SHIFT OF PEAK FLOW (min)=132.00
MAXIMUM STORAGE USED (ha.m.)= 0.6404

CALIB NASHYD (0005) ID= 1 DT= 5.0 min	Area (ha)= 1.33	Ia (mm)= 5.00	U.H. Tp(hrs)= 0.13	Curve Number (CN)= 74.0	# of Linear Res.(N)= 3.00

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	1.83	3.083	2.92	6.083	13.16	9.08	2.56
0.167	1.83	3.167	2.92	6.167	13.16	9.17	2.56
0.250	1.83	3.250	2.92	6.250	13.16	9.25	2.56
0.333	1.83	3.333	2.92	6.333	13.16	9.33	2.56
0.417	1.83	3.417	2.92	6.417	13.16	9.42	2.56
0.500	1.83	3.500	2.92	6.500	13.16	9.50	2.56
0.583	1.83	3.583	2.92	6.583	5.85	9.58	2.56
0.667	1.83	3.667	2.92	6.667	5.85	9.67	2.56
0.750	1.83	3.750	2.92	6.750	5.85	9.75	2.56
0.833	1.83	3.833	2.92	6.833	5.85	9.83	2.56
0.917	1.83	3.917	2.92	6.917	5.85	9.92	2.56
1.000	1.83	4.000	2.92	7.000	5.85	10.00	2.56
1.083	1.83	4.083	4.39	7.083	4.39	10.08	1.46
1.167	1.83	4.167	4.39	7.167	4.39	10.17	1.46
1.250	1.83	4.250	4.39	7.250	4.39	10.25	1.46
1.333	1.83	4.333	4.39	7.333	4.39	10.33	1.46
1.417	1.83	4.417	4.39	7.417	4.39	10.42	1.46
1.500	1.83	4.500	4.39	7.500	4.39	10.50	1.46
1.583	1.83	4.583	5.85	7.583	4.39	10.58	1.46
1.667	1.83	4.667	5.85	7.667	4.39	10.67	1.46
1.750	1.83	4.750	5.85	7.750	4.39	10.75	1.46
1.833	1.83	4.833	5.85	7.833	4.39	10.83	1.46
1.917	1.83	4.917	5.85	7.917	4.39	10.92	1.46
2.000	1.83	5.000	5.85	8.000	4.39	11.00	1.46
2.083	2.19	5.083	8.77	8.083	2.56	11.08	1.46
2.167	2.19	5.167	8.77	8.167	2.56	11.17	1.46
2.250	2.19	5.250	8.77	8.250	2.56	11.25	1.46
2.333	2.19	5.333	8.77	8.333	2.56	11.33	1.46
2.417	2.19	5.417	8.77	8.417	2.56	11.42	1.46
2.500	2.19	5.500	8.77	8.500	2.56	11.50	1.46
2.583	2.19	5.583	35.09	8.583	2.56	11.58	1.46
2.667	2.19	5.667	35.09	8.667	2.56	11.67	1.46
2.750	2.19	5.750	35.09	8.750	2.56	11.75	1.46
2.833	2.19	5.833	96.49	8.833	2.56	11.83	1.46
2.917	2.19	5.917	96.49	8.917	2.56	11.92	1.46
3.000	2.19	6.000	96.49	9.000	2.56	12.00	1.46

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.147 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 29.182

TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.399

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.93	0.52
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	1.83	3.200	2.92	6.200	13.16	9.20	2.56
0.400	1.83	3.400	2.92	6.400	13.16	9.40	2.56
0.600	1.83	3.600	2.92	6.600	9.50	9.60	2.56
0.800	1.83	3.800	2.92	6.800	5.85	9.80	2.56
1.000	1.83	4.000	2.92	7.000	5.85	10.00	2.56
1.200	1.83	4.200	4.39	7.200	4.39	10.20	1.46
1.400	1.83	4.400	4.39	7.400	4.39	10.40	1.46
1.600	1.83	4.600	5.12	7.600	4.39	10.60	1.46
1.800	1.83	4.800	5.85	7.800	4.39	10.80	1.46
2.000	1.83	5.000	5.85	8.000	4.39	11.00	1.46
2.200	2.19	5.200	8.77	8.200	2.56	11.20	1.46
2.400	2.19	5.400	8.77	8.400	2.56	11.40	1.46
2.600	2.19	5.600	21.93	8.600	2.56	11.60	1.46
2.800	2.19	5.800	50.44	8.800	2.56	11.80	1.46
3.000	2.19	6.000	96.49	9.000	2.56	12.00	1.46

			TOTALS
Max.Eff.Inten.(mm/hr)=	96.49	50.24	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.02 (ii)	7.15 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
PEAK FLOW (cms)=	0.25	0.06	0.313 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	72.10	31.87	57.62
TOTAL RAINFALL (mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT =	0.99	0.44	0.79

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.01	2.61
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

			TOTALS
Max.Eff.Inten.(mm/hr)=	96.49	50.24	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.02 (ii)	7.15 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
PEAK FLOW (cms)=	0.27	0.32	0.591 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	72.10	31.87	43.14
TOTAL RAINFALL (mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT =	0.99	0.44	0.59

***** 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 (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.313	6.00	57.62
+ ID2= 2 (0005):	1.33	0.147	6.00	29.18
ID = 3 (0007):	2.78	0.459	6.00	44.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.459	6.00	44.22
+ ID2= 2 (0063):	3.62	0.591	6.00	43.14
ID = 1 (0007):	6.40	1.050	6.00	43.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	1.050	6.00	43.77
OUTFLOW: ID= 1 (0033)	6.400	0.076	7.00	43.68

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.23
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1778

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.08	7.00	43.68	0.12	0.92

OUTFLOW: ID= 1 (0034) 6.40 0.08 7.33 43.68 0.12 0.92

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.660 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 28.431
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.389

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 0.816 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 28.709
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.393

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.151 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 28.901
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.395

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	10.97	7.01
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		96.49	50.24
over (min)		12.00	12.00
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	2.94 0.86 3.798 (iii)
TIME TO PEAK	(hrs)=	6.00 6.00 6.00
RUNOFF VOLUME	(mm)=	72.10 31.87 56.41
TOTAL RAINFALL	(mm)=	73.10 73.10 73.10
RUNOFF COEFFICIENT	=	0.99 0.44 0.77

***** 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 (0039)
ID= 1 DT=12.0 min

Area (ha)= 1.21
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.67	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		96.49	50.24
over (min)		12.00	12.00
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.18 0.07 0.245 (iii)
TIME TO PEAK	(hrs)=	6.00 6.00 6.00
RUNOFF VOLUME	(mm)=	72.10 31.87 53.99
TOTAL RAINFALL	(mm)=	73.10 73.10 73.10
RUNOFF COEFFICIENT	=	0.99 0.44 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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.25	6.00	53.99
MAJOR SYS.(ID= 2):	0.10	0.08	6.00	53.99
MINOR SYS.(ID= 3):	1.11	0.17	6.00	53.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0047)
ID= 1 DT=12.0 min

Area (ha)= 1.50
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.96	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		96.49	50.24
over (min)		12.00	12.00
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.26 0.07 0.323 (iii)
TIME TO PEAK	(hrs)=	6.00 6.00 6.00
RUNOFF VOLUME	(mm)=	72.10 31.87 57.62
TOTAL RAINFALL	(mm)=	73.10 73.10 73.10
RUNOFF COEFFICIENT	=	0.99 0.44 0.79

***** 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.

DUHYD (0072)
Inlet Cap.=0.363
#of Inlets= 1

Total(cms)= 0.4		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):		1.50	0.32	6.00	57.62
MAJOR SYS.(ID= 2):		0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):		1.50	0.32	6.00	57.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0035):	8.03	0.660	6.00	28.43
+ ID2= 2 (0036):	17.98	3.798	6.00	56.41
ID = 3 (0040):	26.01	4.459	6.00	47.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) | 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	26.01	4.459	6.00	47.77
+ ID2= 2 (0037):	10.64	0.816	6.00	28.71
ID = 1 (0040):	36.65	5.275	6.00	42.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	36.65	5.275	6.00	42.24
+ ID2= 2 (0038):	2.11	0.151	6.00	28.90
ID = 3 (0040):	38.76	5.425	6.00	41.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) | 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0072 <ID= 2> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003				
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003				
ID1= 3 (0040):	38.76	5.425	6.00	41.51
+ ID2= 2 (0072):	0.00	0.000	0.00	0.00
ID = 1 (0040):	38.76	5.425	6.00	41.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	38.76	5.425	6.00	41.51
+ ID2= 2 (0074):	0.10	0.076	6.00	53.99
ID = 3 (0040):	38.86	5.501	6.00	41.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0034):	6.40	0.075	7.33	43.68
+ ID2= 2 (0040):	38.86	5.501	6.00	41.54
ID = 3 (0041):	45.26	5.529	6.00	42.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0043) | IN= 2---> OUT= 1 | DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	3.1150	0.9004
1.2740	0.5550	3.6250	1.1600
2.2650	0.7154	3.9640	1.3570

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0041)	45.261	5.529	6.00	42.05
OUTFLOW: ID= 1 (0043)	45.261	1.771	6.25	42.05

PEAK FLOW REDUCTION [Qout/Qin](%)= 32.02
TIME SHIFT OF PEAK FLOW (min)= 15.00
MAXIMUM STORAGE USED (ha.m.)= 0.6363

CALIB | NASHYD (0044) | ID= 1 DT=12.0 min

Area (ha)= 3.28 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.10

Unit Hyd Qpeak (cms)= 1.253

PEAK FLOW (cms)= 0.261 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 18.595
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.254

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | NASHYD (0046) | ID= 1 DT=12.0 min

Area (ha)= 2.21 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.23

Unit Hyd Qpeak (cms)= 0.367

PEAK FLOW (cms)= 0.176 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 28.583
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.391

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0045) | ID= 1 DT=12.0 min

Area (ha)= 10.16
Total Imp(%)= 66.00 Dir. Conn.(%)= 66.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	6.71	3.45	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		96.49	50.24	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.02 (ii)	7.15 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.80	0.42	2.220 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	72.10	31.87	58.42
TOTAL RAINFALL	(mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT	=	0.99	0.44	0.80

***** 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 (0059)	Area (ha)= 1.27				
ID= 1 DT=12.0 min	Total Imp(%)= 68.00	Dir. Conn.(%)= 68.00			
	IMPERVIOUS	PERVIOUS (i)			
Surface Area (ha)=	0.86	0.41			
Dep. Storage (mm)=	1.00	1.50			
Average Slope (%)=	2.00	2.00			
Length (m)=	30.00	20.00			
Mannings n =	0.013	0.250			
Max.Eff.Inten.(mm/hr)=	96.49	50.24			
over (min)	12.00	12.00			
Storage Coeff. (min)=	1.02 (ii)	7.15 (ii)			
Unit Hyd. Tpeak (min)=	12.00	12.00			
Unit Hyd. peak (cms)=	0.14	0.12			
			TOTALS		
PEAK FLOW (cms)=	0.23	0.05	0.281 (iii)		
TIME TO PEAK (hrs)=	6.00	6.00	6.00		
RUNOFF VOLUME (mm)=	72.10	31.87	59.22		
TOTAL RAINFALL (mm)=	73.10	73.10	73.10		
RUNOFF COEFFICIENT =	0.99	0.44	0.81		

***** 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.

DUHYD (0069)				
Inlet Cap.=0.320				
#of Inlets= 1				
Total(cms)= 0.3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.28	6.00	59.22
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.27	0.28	6.00	59.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0070)	Area (ha)= 2.50				
ID= 1 DT=12.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00			
	IMPERVIOUS	PERVIOUS (i)			
Surface Area (ha)=	1.38	1.12			
Dep. Storage (mm)=	1.00	1.50			
Average Slope (%)=	2.00	2.00			
Length (m)=	30.00	20.00			
Mannings n =	0.013	0.250			
Max.Eff.Inten.(mm/hr)=	96.49	50.24			
over (min)	12.00	12.00			
Storage Coeff. (min)=	1.02 (ii)	7.15 (ii)			
Unit Hyd. Tpeak (min)=	12.00	12.00			
Unit Hyd. peak (cms)=	0.14	0.12			
			TOTALS		
PEAK FLOW (cms)=	0.37	0.14	0.506 (iii)		
TIME TO PEAK (hrs)=	6.00	6.00	6.00		
RUNOFF VOLUME (mm)=	72.10	31.87	54.00		
TOTAL RAINFALL (mm)=	73.10	73.10	73.10		
RUNOFF COEFFICIENT =	0.99	0.44	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.

DUHYD (0071)				
Inlet Cap.=0.550				
#of Inlets= 1				
Total(cms)= 0.6	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.50	0.51	6.00	54.00
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.50	0.51	6.00	54.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0044):	3.28	0.261	6.00	18.59
+ ID2= 2 (0045):	10.16	2.220	6.00	58.42
ID = 3 (0048):	13.44	2.482	6.00	48.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	13.44	2.482	6.00	48.70
+ ID2= 2 (0046):	2.21	0.176	6.00	28.58
ID = 1 (0048):	15.65	2.657	6.00	45.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0048):	15.65	2.657	6.00	45.86
+ ID2= 2 (0069):	1.27	0.281	6.00	59.22
ID = 3 (0048):	16.92	2.938	6.00	46.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	16.92	2.938	6.00	46.86
+ ID2= 2 (0071):	2.50	0.506	6.00	54.00
ID = 1 (0048):	19.42	3.445	6.00	47.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0048):	19.42	3.445	6.00	47.78
+ ID2= 2 (0072):	1.50	0.323	6.00	57.62
ID = 3 (0048):	20.92	3.768	6.00	48.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.9630	0.3823
	0.5430	0.1233	1.3030	0.6907
	0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.920	3.768	6.00	48.49
OUTFLOW: ID= 1 (0049)	20.920	0.958	6.20	48.49

PEAK FLOW REDUCTION [Qout/Qin](%)= 25.44
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.3822

ROUTE PIPE (0050)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 467.00
Slope (m/m)= 0.006
Manning n = 0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.92	0.96	6.20	48.49	0.41	2.29
OUTFLOW: ID= 1 (0050)	20.92	0.96	6.30	48.48	0.41	2.29

CALIB
NASHYD (0054)
ID= 1 DT=12.0 min

Area (ha)= 1.34 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.110 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 28.431
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.389

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0056)
ID= 1 DT=12.0 min

Area (ha)= 0.10 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 2.535
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.035

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0058)
ID= 1 DT=12.0 min

Area (ha)= 2.51 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.173 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 28.975
TOTAL RAINFALL (mm)= 73.100
RUNOFF COEFFICIENT = 0.396

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0057)
ID= 1 DT=12.0 min

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.33	0.14	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	96.49	50.24	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.02 (ii)	7.15 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.09	0.02	0.105 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	72.10	31.87	60.02
TOTAL RAINFALL (mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT =	0.99	0.44	0.82

***** 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 (0073)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.105	6.00	60.02
+ ID2= 2 (0058):	2.51	0.173	6.00	28.97
ID = 3 (0073):	2.98	0.278	6.00	33.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066)
Inlet Cap.=0.181
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.28	6.00	33.87
MAJOR SYS.(ID= 2):	0.21	0.10	6.00	33.87
MINOR SYS.(ID= 3):	2.77	0.18	6.00	33.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0053)
ID= 1 DT=12.0 min

Area (ha)= 5.86
Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	2.58
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	96.49	50.24

```
                over (min)       12.00        12.00
     Storage Coeff.  (min)=       1.02 (ii)    7.15 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.88         0.32      1.195 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00       6.00
     RUNOFF VOLUME    (mm)=      72.10        31.87      54.40
     TOTAL RAINFALL   (mm)=      73.10        73.10      73.10
     RUNOFF COEFFICIENT   =       0.99         0.44       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.

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------------------
| CALIB                |
| STANDHYD  (0055)     |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      96.49        50.24
                over (min)       12.00        12.00
     Storage Coeff.  (min)=       1.02 (ii)    7.15 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.25       0.430 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00       6.00
     RUNOFF VOLUME    (mm)=      72.10        31.87      41.93
     TOTAL RAINFALL   (mm)=      73.10        73.10      73.10
     RUNOFF COEFFICIENT   =       0.99         0.44       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.

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------------------
| CALIB                |
| STANDHYD  (0065)     |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      96.49        50.24
                over (min)       12.00        12.00
     Storage Coeff.  (min)=       1.02 (ii)    7.15 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.25       0.430 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00       6.00
     RUNOFF VOLUME    (mm)=      72.10        31.87      41.93
     TOTAL RAINFALL   (mm)=      73.10        73.10      73.10
     RUNOFF COEFFICIENT   =       0.99         0.44       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.

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| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0053):     5.86   1.195     6.00    54.40
        + ID2= 2 (0054):     1.34   0.110     6.00    28.43
          ================================================
          ID = 3 (0051):     7.20   1.305     6.00    49.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0051):     7.20   1.305     6.00    49.57
        + ID2= 2 (0055):     2.71   0.430     6.00    41.93
          ================================================
          ID = 1 (0051):     9.91   1.736     6.00    47.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0051):     9.91   1.736     6.00    47.48
        + ID2= 2 (0056):     0.10   0.001     6.00     2.53
          ================================================
          ID = 3 (0051):    10.01   1.737     6.00    47.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0051):    10.01   1.737     6.00    47.03
        + ID2= 2 (0065):     2.71   0.430     6.00    41.93
          ================================================
          ID = 1 (0051):    12.72   2.167     6.00    45.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0051):    12.72   2.167     6.00    45.94
        + ID2= 2 (0066):     2.77   0.181     6.00    33.87
          ================================================
          ID = 3 (0051):    15.49   2.348     6.00    43.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0051):    15.49   2.348     6.00    43.78
        + ID2= 2 (0069):     0.00   0.000     0.00     0.00
          ================================================
          ID = 1 (0051):    15.49   2.348     6.00    43.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0060) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)     (cms)    (hrs)     (mm)
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ID1= 1 (0050):	20.92	0.956	6.30	48.48
+ ID2= 2 (0051):	15.49	2.348	6.00	43.78
ID = 3 (0060):	36.41	3.110	6.00	46.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.5100	0.3577
0.2970	0.1233	0.6800	0.7154
0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.414	3.110	6.00	46.50
OUTFLOW: ID= 1 (0061)	36.414	0.667	7.90	46.49

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.45
TIME SHIFT OF PEAK FLOW (min)=114.00
MAXIMUM STORAGE USED (ha.m.)= 0.6881

****
** SIMULATION NUMBER: 5 **
****

READ STORM
Ptotal= 80.80 mm

Filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2b35c34-fbac-4525-847e-f59c2b644911\684d4ea3
Comments: 50-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.02	3.25	3.23	6.25	14.54	9.25	2.83
0.50	2.02	3.50	3.23	6.50	14.54	9.50	2.83
0.75	2.02	3.75	3.23	6.75	6.46	9.75	2.83
1.00	2.02	4.00	3.23	7.00	6.46	10.00	2.83
1.25	2.02	4.25	4.85	7.25	4.85	10.25	1.62
1.50	2.02	4.50	4.85	7.50	4.85	10.50	1.62
1.75	2.02	4.75	6.46	7.75	4.85	10.75	1.62
2.00	2.02	5.00	6.46	8.00	4.85	11.00	1.62
2.25	2.42	5.25	9.70	8.25	2.83	11.25	1.62
2.50	2.42	5.50	9.70	8.50	2.83	11.50	1.62
2.75	2.42	5.75	38.78	8.75	2.83	11.75	1.62
3.00	2.42	6.00	106.66	9.00	2.83	12.00	1.62

CALIB
NASHYD (0011)
ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	2.02	3.200	3.23	6.200	14.54	9.20	2.83
0.400	2.02	3.400	3.23	6.400	14.54	9.40	2.83
0.600	2.02	3.600	3.23	6.600	10.50	9.60	2.83
0.800	2.02	3.800	3.23	6.800	6.46	9.80	2.83
1.000	2.02	4.000	3.23	7.000	6.46	10.00	2.83
1.200	2.02	4.200	4.85	7.200	4.85	10.20	1.62
1.400	2.02	4.400	4.85	7.400	4.85	10.40	1.62
1.600	2.02	4.600	5.66	7.600	4.85	10.60	1.62
1.800	2.02	4.800	6.46	7.800	4.85	10.80	1.62
2.000	2.02	5.000	6.46	8.000	4.85	11.00	1.62
2.200	2.42	5.200	9.70	8.200	2.83	11.20	1.62
2.400	2.42	5.400	9.70	8.400	2.83	11.40	1.62
2.600	2.42	5.600	24.24	8.600	2.83	11.60	1.62
2.800	2.42	5.800	55.75	8.800	2.83	11.80	1.62
3.000	2.42	6.000	106.66	9.000	2.83	12.00	1.62

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.102 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 31.864
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.394

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0010)
ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.36	1.51
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	106.66	58.79
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.74 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.70	0.22	0.919 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	63.23
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.78

***** 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 (0012)
ID= 1 DT=12.0 min

Area (ha)= 6.86
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.18	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	213.85	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	106.66	58.79
over	(min)	12.00	12.00
Storage Coeff.	(min)=	3.19 (ii)	8.95 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

				TOTALS
PEAK FLOW	(cms)=	1.23	0.36	1.585 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	63.23
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.78

***** 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 (0064)
ID= 1 DT=12.0 min

Area (ha)= 2.95
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.74	2.21
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	106.66	58.79	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.22	0.32	0.540 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	79.80	37.31	47.93
TOTAL RAINFALL (mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT =	0.99	0.46	0.59

***** 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 (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.919	6.00	63.23
+ ID2= 2 (0011):	0.91	0.102	6.00	31.86
ID = 3 (0013):	4.78	1.021	6.00	57.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	1.021	6.00	57.26
+ ID2= 2 (0012):	6.86	1.585	6.00	63.23
ID = 1 (0013):	11.64	2.606	6.00	60.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	2.606	6.00	60.78
+ ID2= 2 (0064):	2.95	0.540	6.00	47.93
ID = 3 (0013):	14.59	3.146	6.00	58.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	3.146	6.00	58.18
OUTFLOW: ID= 1 (0021)	14.590	0.599	6.30	58.16

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.05
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.4123

ROUTE PIPE (0031)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.60	6.30	58.16	0.34	1.88
OUTFLOW: ID= 1 (0031)	14.59	0.60	6.30	58.16	0.34	1.88

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.697 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 32.771
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.406

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.62	0.35
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	106.66	58.79
over (min)	12.00	12.00
Storage Coeff. (min)=	0.98 (ii)	6.74 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12
		TOTALS
PEAK FLOW (cms)=	0.18	0.05 0.235 (iii)
TIME TO PEAK (hrs)=	6.00	6.00 6.00
RUNOFF VOLUME (mm)=	79.80	37.31 64.50
TOTAL RAINFALL (mm)=	80.80	80.80 80.80
RUNOFF COEFFICIENT =	0.99	0.46 0.80

***** 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 (0017)
ID= 1 DT=12.0 min

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

IMPERVIOUS PERVIOUS (i)

Surface Area	(ha)=	1.29	1.05	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	106.66	58.79	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.38	0.15	0.534 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	60.68
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.75

***** 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 (0019)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.697	6.00	32.77
+ ID2= 2 (0017):	2.34	0.534	6.00	60.68
ID = 3 (0019):	8.87	1.232	6.00	40.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	1.232	6.00	40.13
+ ID2= 2 (0018):	0.97	0.235	6.00	64.50
ID = 1 (0019):	9.84	1.466	6.00	42.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	1.466	6.00	42.53
+ ID2= 2 (0031):	14.59	0.602	6.30	58.16
ID = 3 (0032):	24.43	1.890	6.00	51.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	1.890	6.00	51.87
OUTFLOW: ID= 1 (0022)	24.430	0.560	7.60	51.86

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.64
TIME SHIFT OF PEAK FLOW (min)= 96.00
MAXIMUM STORAGE USED (ha.m.)= 0.3635

CALIB
NASHYD (0023)
ID= 1 DT=12.0 min

Area (ha)= 10.18 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 1.440

PEAK FLOW (cms)= 0.831 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 34.223
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.424

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0025)
ID= 1 DT=12.0 min

Area (ha)= 2.59 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.253 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 33.581
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.416

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0027)
ID= 1 DT=12.0 min

Area (ha)= 1.61 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.181 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 28.173
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.349

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0024)
ID= 1 DT=12.0 min

Area (ha)= 6.71
Total Imp(%)= 71.00 Dir. Conn.(%)= 71.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.76	1.95	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	106.66	58.79	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.41	0.28	1.695 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	67.48
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	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 (0062)

Area (ha)= 0.85

|ID= 1 DT=12.0 min | Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	106.66	58.79
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.74 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.160 (iii)
TIME TO PEAK	(hrs)=	6.00
RUNOFF VOLUME	(mm)=	49.20
TOTAL RAINFALL	(mm)=	80.80
RUNOFF COEFFICIENT	=	0.61

***** 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 (0028)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0023):	10.18	0.831	6.00	34.22
	+ ID2= 2 (0024):	6.71	1.695	6.00	67.48
	ID = 3 (0028):	16.89	2.526	6.00	47.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0028):	16.89	2.526	6.00	47.43
	+ ID2= 2 (0025):	2.59	0.253	6.00	33.58
	ID = 1 (0028):	19.48	2.778	6.00	45.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0028):	19.48	2.778	6.00	45.59
	+ ID2= 2 (0027):	1.61	0.181	6.00	28.17
	ID = 3 (0028):	21.09	2.959	6.00	44.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0028):	21.09	2.959	6.00	44.26
	+ ID2= 2 (0062):	0.85	0.160	6.00	49.20
	ID = 1 (0028):	21.94	3.119	6.00	44.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0022):	24.43	0.560	7.60	51.86
	+ ID2= 2 (0028):	21.94	3.119	6.00	44.45
	ID = 3 (0029):	46.37	3.500	6.00	48.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1	0.0000	0.0000	1.3030	1.3940
DT= 5.0 min	0.4380	0.4440	1.5000	1.8008
	0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	3.500	6.00	48.40
OUTFLOW: ID= 1 (0030)	46.370	0.714	8.20	48.40

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.39
TIME SHIFT OF PEAK FLOW (min)=132.00
MAXIMUM STORAGE USED (ha.m.)= 0.7213

CALIB					
NASHYD (0005)	Area	(ha)= 1.33	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)= 0.13				

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	2.02	3.083	3.23	6.083	14.54	9.08	2.83
0.167	2.02	3.167	3.23	6.167	14.54	9.17	2.83
0.250	2.02	3.250	3.23	6.250	14.54	9.25	2.83
0.333	2.02	3.333	3.23	6.333	14.54	9.33	2.83
0.417	2.02	3.417	3.23	6.417	14.54	9.42	2.83
0.500	2.02	3.500	3.23	6.500	14.54	9.50	2.83
0.583	2.02	3.583	3.23	6.583	6.46	9.58	2.83
0.667	2.02	3.667	3.23	6.667	6.46	9.67	2.83
0.750	2.02	3.750	3.23	6.750	6.46	9.75	2.83
0.833	2.02	3.833	3.23	6.833	6.46	9.83	2.83
0.917	2.02	3.917	3.23	6.917	6.46	9.92	2.83
1.000	2.02	4.000	3.23	7.000	6.46	10.00	2.83
1.083	2.02	4.083	4.85	7.083	4.85	10.08	1.62
1.167	2.02	4.167	4.85	7.167	4.85	10.17	1.62
1.250	2.02	4.250	4.85	7.250	4.85	10.25	1.62
1.333	2.02	4.333	4.85	7.333	4.85	10.33	1.62
1.417	2.02	4.417	4.85	7.417	4.85	10.42	1.62
1.500	2.02	4.500	4.85	7.500	4.85	10.50	1.62
1.583	2.02	4.583	6.46	7.583	4.85	10.58	1.62
1.667	2.02	4.667	6.46	7.667	4.85	10.67	1.62
1.750	2.02	4.750	6.46	7.750	4.85	10.75	1.62
1.833	2.02	4.833	6.46	7.833	4.85	10.83	1.62
1.917	2.02	4.917	6.46	7.917	4.85	10.92	1.62
2.000	2.02	5.000	6.46	8.000	4.85	11.00	1.62
2.083	2.42	5.083	9.70	8.083	2.83	11.08	1.62
2.167	2.42	5.167	9.70	8.167	2.83	11.17	1.62
2.250	2.42	5.250	9.70	8.250	2.83	11.25	1.62
2.333	2.42	5.333	9.70	8.333	2.83	11.33	1.62
2.417	2.42	5.417	9.70	8.417	2.83	11.42	1.62
2.500	2.42	5.500	9.70	8.500	2.83	11.50	1.62
2.583	2.42	5.583	38.78	8.583	2.83	11.58	1.62
2.667	2.42	5.667	38.78	8.667	2.83	11.67	1.62
2.750	2.42	5.750	38.79	8.750	2.83	11.75	1.62
2.833	2.42	5.833	106.66	8.833	2.83	11.83	1.62
2.917	2.42	5.917	106.66	8.917	2.83	11.92	1.62
3.000	2.42	6.000	106.65	9.000	2.83	12.00	1.62

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.174 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 34.468
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.427

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0004) ID= 1 DT=12.0 min	Area (ha)= 1.45 Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	2.02	3.200	3.23	6.200	14.54	9.20	2.83
0.400	2.02	3.400	3.23	6.400	14.54	9.40	2.83
0.600	2.02	3.600	3.23	6.600	10.50	9.60	2.83
0.800	2.02	3.800	3.23	6.800	6.46	9.80	2.83
1.000	2.02	4.000	3.23	7.000	6.46	10.00	2.83
1.200	2.02	4.200	4.85	7.200	4.85	10.20	1.62
1.400	2.02	4.400	4.85	7.400	4.85	10.40	1.62
1.600	2.02	4.600	5.66	7.600	4.85	10.60	1.62
1.800	2.02	4.800	6.46	7.800	4.85	10.80	1.62
2.000	2.02	5.000	6.46	8.000	4.85	11.00	1.62
2.200	2.42	5.200	9.70	8.200	2.83	11.20	1.62
2.400	2.42	5.400	9.70	8.400	2.83	11.40	1.62
2.600	2.42	5.600	24.24	8.600	2.83	11.60	1.62
2.800	2.42	5.800	55.75	8.800	2.83	11.80	1.62
3.000	2.42	6.000	106.66	9.000	2.83	12.00	1.62

Max.Eff.Inten.(mm/hr)=		106.66	58.79	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.27	0.08	0.351 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	64.50
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.80

***** 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 (0063) ID= 1 DT=12.0 min	Area (ha)= 3.62 Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=		106.66	58.79	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.30	0.38	0.679 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	49.21
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.61

***** 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 (0007) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.351	6.00	64.50
+ ID2= 2 (0005):	1.33	0.174	6.00	34.47
ID = 3 (0007):	2.78	0.525	6.00	50.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.525	6.00	50.37
+ ID2= 2 (0063):	3.62	0.679	6.00	49.21
ID = 1 (0007):	6.40	1.204	6.00	49.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.3260	0.8017
	0.0790	0.1850	0.3960	0.9004
	0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	1.204	6.00	49.91
OUTFLOW: ID= 1 (0033)	6.400	0.091	6.92	49.81

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.56
TIME SHIFT OF PEAK FLOW (min)= 55.00
MAXIMUM STORAGE USED (ha.m.)= 0.2021

ROUTE PIPE (0034) IN= 2---> OUT= 1 DT= 5.0 min		
	PIPE Number	= 1.00
	Diameter	(mm)=1650.00
	Length	(m)= 850.00
	Slope	(m/m)= 0.005
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.09	6.92	49.81	0.13	0.97
OUTFLOW: ID= 1 (0034)	6.40	0.09	7.17	49.81	0.13	0.97

CALIB			
NASHYD (0035)	Area (ha)= 8.03	Curve Number (CN)= 74.0	
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.22		

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.783 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 33.581
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.416

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0037)	Area (ha)= 10.64	Curve Number (CN)= 74.0	
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.24		

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 0.968 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 33.908
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.420

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0038)	Area (ha)= 2.11	Curve Number (CN)= 74.0	
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.26		

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.179 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 34.136
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.422

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0036)	Area (ha)= 17.98		
ID= 1 DT=12.0 min	Total Imp(%)= 61.00	Dir. Conn.(%)= 61.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	10.97	7.01	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		106.66	58.79	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	3.25	1.02	4.269 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	63.23
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.78

***** 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 (0039)	Area (ha)= 1.21		
ID= 1 DT=12.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		106.66	58.79	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.08	0.276 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	60.68
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.75

***** 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.

DUHYD (0074)					
Inlet Cap.=0.169					
#of Inlets= 1					
Total(cms)= 0.2		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):		1.21	0.28	6.00	60.68
MAJOR SYS.(ID= 2):		0.13	0.11	6.00	60.68
MINOR SYS.(ID= 3):		1.08	0.17	6.00	60.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0047)	Area (ha)= 1.50		
ID= 1 DT=12.0 min	Total Imp(%)= 64.00	Dir. Conn.(%)= 64.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.96	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		106.66	58.79	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.74 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.28	0.08	0.363 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	64.50
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.80

***** 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.

DUHYD (0072)					
Inlet Cap.=0.363					
#of Inlets= 1					
Total(cms)= 0.4		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):		1.50	0.36	6.00	64.50

CALIB

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     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   1.50      0.36      6.00   64.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0035):      8.03   0.783     6.00     33.58
       + ID2= 2 (0036):     17.98   4.269     6.00     63.23
         ================================================
         ID = 3 (0040):     26.01   5.052     6.00     54.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
         ID1= 3 (0040):     26.01   5.052     6.00     54.08
       + ID2= 2 (0037):     10.64   0.968     6.00     33.91
         ================================================
         ID = 1 (0040):     36.65   6.021     6.00     48.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0040):     36.65   6.021     6.00     48.22
       + ID2= 2 (0038):      2.11   0.179     6.00     34.14
         ================================================
         ID = 3 (0040):     38.76   6.199     6.00     47.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
*** W A R N I N G :  HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
         ID1= 3 (0040):     38.76   6.199     6.00     47.45
       + ID2= 2 (0072):      0.00   0.000     0.00      0.00
         ================================================
         ID = 1 (0040):     38.76   6.199     6.00     47.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0040):     38.76   6.199     6.00     47.45
       + ID2= 2 (0074):      0.13   0.107     6.00     60.68
         ================================================
         ID = 3 (0040):     38.89   6.307     6.00     47.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0041) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0034):      6.40   0.090     7.17     49.81
       + ID2= 2 (0040):     38.89   6.307     6.00     47.50
         ================================================
         ID = 3 (0041):     45.29   6.338     6.00     48.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |    OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |     (cms)     (ha.m.)
                          0.0000     0.0000    |    3.1150      0.9004
                          1.2740     0.5550    |    3.6250      1.1600
                          2.2650     0.7154    |    3.9640      1.3570

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0041)     45.287     6.338      6.00      48.05
     OUTFLOW: ID= 1 (0043)     45.287     2.232      6.25      48.05

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 35.21
                  TIME SHIFT OF PEAK FLOW         (min)= 15.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.7117

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| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.308 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  21.962
     TOTAL RAINFALL   (mm)=  80.800
     RUNOFF COEFFICIENT   =   0.272

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.208 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  33.760
     TOTAL RAINFALL   (mm)=  80.800
     RUNOFF COEFFICIENT   =   0.418

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71          3.45
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     106.66         58.79
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       0.98 (ii)     6.74 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.99          0.50       2.489 (iii)
     TIME TO PEAK    (hrs)=       6.00          6.00        6.00
     RUNOFF VOLUME    (mm)=      79.80         37.31       65.35
     TOTAL RAINFALL   (mm)=      80.80         80.80       80.80
     RUNOFF COEFFICIENT   =       0.99          0.46        0.81

***** 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.
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| CALIB              |
| STANDHYD  (0059)   |   Area    (ha)=   1.27
|ID= 1 DT=12.0 min   |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        0.86          0.41
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n          =        0.013         0.250

     Max.Eff.Inten.(mm/hr)=      106.66         58.79
                over (min)       12.00         12.00
     Storage Coeff.  (min)=        0.98 (ii)     6.74 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                              *TOTALS*
     PEAK FLOW       (cms)=        0.26          0.06           0.315 (iii)
     TIME TO PEAK    (hrs)=        6.00          6.00            6.00
     RUNOFF VOLUME    (mm)=       79.80         37.31           66.20
     TOTAL RAINFALL   (mm)=       80.80         80.80           80.80
     RUNOFF COEFFICIENT  =         0.99          0.46            0.82

***** 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.

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--------------------
| DUHYD     (0069)  |
| Inlet Cap.=0.320  |
| #of Inlets=    1  |
| Total(cms)=  0.3  |      AREA     QPEAK      TPEAK    R.V.
--------------------       (ha)     (cms)      (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.27      0.31       6.00   66.20
     ==================================================
     MAJOR SYS.(ID= 2):   0.00      0.00       0.00    0.00
     MINOR SYS.(ID= 3):   1.27      0.31       6.00   66.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB              |
| STANDHYD  (0070)   |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min   |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        1.38          1.12
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n          =        0.013         0.250

     Max.Eff.Inten.(mm/hr)=      106.66         58.79
                over (min)       12.00         12.00
     Storage Coeff.  (min)=        0.98 (ii)     6.74 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                              *TOTALS*
     PEAK FLOW       (cms)=        0.41          0.16           0.571 (iii)
     TIME TO PEAK    (hrs)=        6.00          6.00            6.00
     RUNOFF VOLUME    (mm)=       79.80         37.31           60.68
     TOTAL RAINFALL   (mm)=       80.80         80.80           80.80
     RUNOFF COEFFICIENT  =         0.99          0.46            0.75

***** 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.

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--------------------
| DUHYD     (0071)  |
| Inlet Cap.=0.550  |
| #of Inlets=    1  |
| Total(cms)=  0.6  |      AREA     QPEAK      TPEAK    R.V.
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--------------------       (ha)     (cms)      (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.50      0.57       6.00   60.68
     ==================================================
     MAJOR SYS.(ID= 2):   0.02      0.02       6.00   60.68
     MINOR SYS.(ID= 3):   2.48      0.55       6.00   60.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048)  |
|  1 +  2 =  3      |        AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28   0.308     6.00    21.96
        + ID2= 2 (0045):    10.16   2.489     6.00    65.35
          ===============================================
          ID = 3 (0048):    13.44   2.798     6.00    54.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048)  |
|  3 +  2 =  1      |        AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44   2.798     6.00    54.76
        + ID2= 2 (0046):     2.21   0.208     6.00    33.76
          ===============================================
          ID = 1 (0048):    15.65   3.006     6.00    51.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048)  |
|  1 +  2 =  3      |        AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65   3.006     6.00    51.80
        + ID2= 2 (0069):     1.27   0.315     6.00    66.20
          ===============================================
          ID = 3 (0048):    16.92   3.321     6.00    52.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0048)  |
|  3 +  2 =  1      |        AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.92   3.321     6.00    52.88
        + ID2= 2 (0071):     2.48   0.550     6.00    60.68
          ===============================================
          ID = 1 (0048):    19.40   3.871     6.00    53.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

----------------------------------------------------------------------------
--------------------
| ADD HYD   (0048)  |
|  1 +  2 =  3      |        AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.40   3.871     6.00    53.87
        + ID2= 2 (0072):     1.50   0.363     6.00    64.50
          ===============================================
          ID = 3 (0048):    20.90   4.234     6.00    54.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

----------------------------------------------------------------------------
--------------------
| RESERVOIR (0049)  |
| IN= 2---> OUT= 1  |
| DT=  5.0 min      |     OUTFLOW    STORAGE   |   OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |    (cms)     (ha.m.)
                          0.0000     0.0000    |   0.9630     0.3823
                          0.5430     0.1233    |   1.3030     0.6907
                          0.7650     0.2343    |   1.5860     1.0977

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0048)    20.895     4.234      6.00      54.64
```

OUTFLOW: ID= 1 (0049) 20.895 1.020 6.20 54.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.09
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.4365

| ROUTE PIPE (0050) | PIPE Number = 1.00
| IN= 2---> OUT= 1 | Diameter (mm)=1650.00
| DT= 5.0 min | Length (m)= 467.00
| | Slope (m/m)= 0.006
| | Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.90	1.02	6.20	54.63	0.42	2.34
OUTFLOW: ID= 1 (0050)	20.90	1.02	6.30	54.63	0.42	2.34

| CALIB | Area (ha)= 1.34 Curve Number (CN)= 74.0
| NASHYD (0054) | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|ID= 1 DT=12.0 min | U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.131 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 33.581
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.416

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | Area (ha)= 0.10 Curve Number (CN)= 74.0
| NASHYD (0056) | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|ID= 1 DT=12.0 min | U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 2.994
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.037

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | Area (ha)= 2.51 Curve Number (CN)= 74.0
| NASHYD (0058) | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|ID= 1 DT=12.0 min | U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.205 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 34.223
TOTAL RAINFALL (mm)= 80.800
RUNOFF COEFFICIENT = 0.424

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB | Area (ha)= 0.47
| STANDHYD (0057) | Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00
|ID= 1 DT=12.0 min |

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.33	0.14
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	106.66	58.79
over (min)	12.00	12.00
Storage Coeff. (min)=	0.98 (ii)	6.74 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

			TOTALS
PEAK FLOW	(cms)=	0.10	0.02	0.118 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	67.04
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.83

***** 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 (0073) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.118	6.00	67.04
+ ID2= 2 (0058):	2.51	0.205	6.00	34.22
ID = 3 (0073):	2.98	0.323	6.00	39.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| DUHYD (0066) |
| Inlet Cap.=0.181 |
| #of Inlets= 1 |
| Total(cms)= 0.2 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.32	6.00	39.40
MAJOR SYS.(ID= 2):	0.30	0.14	6.00	39.40
MINOR SYS.(ID= 3):	2.68	0.18	6.00	39.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | Area (ha)= 5.86
| STANDHYD (0053) | Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00
|ID= 1 DT=12.0 min |

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	2.58
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	106.66	58.79
over (min)	12.00	12.00
Storage Coeff. (min)=	0.98 (ii)	6.74 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.97	0.38	1.347 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	61.10
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.76

***** 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 (0055)
ID= 1 DT=12.0 min

Area (ha)= 2.71
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		106.66	58.79
over (min)		12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.74 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.20	0.30	0.496 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	47.93
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.59

***** 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 (0065)
ID= 1 DT=12.0 min

Area (ha)= 2.71
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		106.66	58.79
over (min)		12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.74 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.20	0.30	0.496 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	79.80	37.31	47.93
TOTAL RAINFALL	(mm)=	80.80	80.80	80.80
RUNOFF COEFFICIENT	=	0.99	0.46	0.59

***** 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 (0051)
1 + 2 = 3

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0053):		5.86	1.347	6.00	61.10
+ ID2= 2 (0054):		1.34	0.131	6.00	33.58
ID = 3 (0051):		7.20	1.478	6.00	55.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		7.20	1.478	6.00	55.98
+ ID2= 2 (0055):		2.71	0.496	6.00	47.93
ID = 1 (0051):		9.91	1.974	6.00	53.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
1 + 2 = 3

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0051):		9.91	1.974	6.00	53.78
+ ID2= 2 (0056):		0.10	0.001	6.00	2.99
ID = 3 (0051):		10.01	1.976	6.00	53.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		10.01	1.976	6.00	53.27
+ ID2= 2 (0065):		2.71	0.496	6.00	47.93
ID = 1 (0051):		12.72	2.472	6.00	52.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
1 + 2 = 3

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0051):		12.72	2.472	6.00	52.14
+ ID2= 2 (0066):		2.68	0.181	6.00	39.40
ID = 3 (0051):		15.40	2.653	6.00	49.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003

ID1= 3 (0051):		15.40	2.653	6.00	49.92
+ ID2= 2 (0069):		0.00	0.000	0.00	0.00
ID = 1 (0051):		15.40	2.653	6.00	49.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)
1 + 2 = 3

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0050):		20.90	1.020	6.30	54.63
+ ID2= 2 (0051):		15.40	2.653	6.00	49.92
ID = 3 (0060):		36.29	3.469	6.00	52.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1	0.0000	0.0000	0.5100	0.3577
DT= 5.0 min	0.2970	0.1233	0.6800	0.7154
	0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.294	3.469	6.00	52.65
OUTFLOW: ID= 1 (0061)	36.294	0.699	8.10	52.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.14
TIME SHIFT OF PEAK FLOW (min)=126.00
MAXIMUM STORAGE USED (ha.m.)= 0.7948

****
** SIMULATION NUMBER: 6 **
****

READ STORM | Filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2b35c34-fbac-4525-847e-f59c2b644911\873ccf52
Ptotal= 88.50 mm | Comments: 100-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.21	3.25	3.54	6.25	15.93	9.25	3.10
0.50	2.21	3.50	3.54	6.50	15.93	9.50	3.10
0.75	2.21	3.75	3.54	6.75	7.08	9.75	3.10
1.00	2.21	4.00	3.54	7.00	7.08	10.00	3.10
1.25	2.21	4.25	5.31	7.25	5.31	10.25	1.77
1.50	2.21	4.50	5.31	7.50	5.31	10.50	1.77
1.75	2.21	4.75	7.08	7.75	5.31	10.75	1.77
2.00	2.21	5.00	7.08	8.00	5.31	11.00	1.77
2.25	2.65	5.25	10.62	8.25	3.10	11.25	1.77
2.50	2.65	5.50	10.62	8.50	3.10	11.50	1.77
2.75	2.65	5.75	42.48	8.75	3.10	11.75	1.77
3.00	2.65	6.00	116.82	9.00	3.10	12.00	1.77

CALIB NASHYD (0011) ID= 1 DT=12.0 min | Area (ha)= 0.91 Curve Number (CN)= 74.0 | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.17

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	2.21	3.200	3.54	6.200	15.93	9.20	3.10
0.400	2.21	3.400	3.54	6.400	15.93	9.40	3.10
0.600	2.21	3.600	3.54	6.600	11.51	9.60	3.10
0.800	2.21	3.800	3.54	6.800	7.08	9.80	3.10
1.000	2.21	4.000	3.54	7.000	7.08	10.00	3.10
1.200	2.21	4.200	5.31	7.200	5.31	10.20	1.77
1.400	2.21	4.400	5.31	7.400	5.31	10.40	1.77
1.600	2.21	4.600	6.19	7.600	5.31	10.60	1.77
1.800	2.21	4.800	7.08	7.800	5.31	10.80	1.77
2.000	2.21	5.000	7.08	8.000	5.31	11.00	1.77
2.200	2.65	5.200	10.62	8.200	3.10	11.20	1.77
2.400	2.65	5.400	10.62	8.400	3.10	11.40	1.77
2.600	2.65	5.600	26.55	8.600	3.10	11.60	1.77
2.800	2.65	5.800	61.06	8.800	3.10	11.80	1.77
3.000	2.66	6.000	116.82	9.000	3.10	12.00	1.77

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.118 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 36.943
TOTAL RAINFALL (mm)= 88.500
RUNOFF COEFFICIENT = 0.417

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0010) ID= 1 DT=12.0 min | Area (ha)= 3.87 | Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.36	1.51
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	116.82	67.62
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.95 (ii)	6.39 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.77	0.26	1.022 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	70.12
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.79

***** 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 (0012) ID= 1 DT=12.0 min | Area (ha)= 6.86 | Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.18	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	213.85	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	116.82	67.62
over	(min)	12.00	12.00
Storage Coeff.	(min)=	3.08 (ii)	8.52 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

		TOTALS
PEAK FLOW	(cms)=	1.34	0.42	1.765 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	70.12
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.79

***** 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 (0064) ID= 1 DT=12.0 min | Area (ha)= 2.95 | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.74	2.21
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	116.82	67.62
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.95 (ii)	6.39 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00

Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.24	0.38	0.614 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	54.08
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.61

***** 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 (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	1.022	6.00	70.12
+ ID2= 2 (0011):	0.91	0.118	6.00	36.94
ID = 3 (0013):	4.78	1.140	6.00	63.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	1.140	6.00	63.81
+ ID2= 2 (0012):	6.86	1.765	6.00	70.12
ID = 1 (0013):	11.64	2.905	6.00	67.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	2.905	6.00	67.53
+ ID2= 2 (0064):	2.95	0.614	6.00	54.08
ID = 3 (0013):	14.59	3.519	6.00	64.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	3.519	6.00	64.81
OUTFLOW: ID= 1 (0021)	14.590	0.654	6.30	64.80

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.59
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.4611

ROUTE PIPE (0031)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.65	6.30	64.80	0.35	1.93
OUTFLOW: ID= 1 (0031)	14.59	0.66	6.30	64.79	0.35	1.93

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.810 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 37.994
TOTAL RAINFALL (mm)= 88.500
RUNOFF COEFFICIENT = 0.429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	116.82	67.62
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.95 (ii)	6.39 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.20	0.06	0.261 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	71.46
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.81

***** 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 (0017)
ID= 1 DT=12.0 min

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00

```
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     116.82        67.62
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.95 (ii)    6.39 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.42         0.18      0.596 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00       6.00
     RUNOFF VOLUME    (mm)=      87.50        42.95      67.45
     TOTAL RAINFALL   (mm)=      88.50        88.50      88.50
     RUNOFF COEFFICIENT   =       0.99         0.49       0.76

***** 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.

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--------------------
| ADD HYD   (0019) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0016):     6.53   0.810     6.00    37.99
       + ID2= 2 (0017):     2.34   0.596     6.00    67.45
         ================================================
         ID = 3 (0019):     8.87   1.406     6.00    45.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0019) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0019):     8.87   1.406     6.00    45.76
       + ID2= 2 (0018):     0.97   0.261     6.00    71.46
         ================================================
         ID = 1 (0019):     9.84   1.666     6.00    48.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0032) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0019):     9.84   1.666     6.00    48.30
       + ID2= 2 (0031):    14.59   0.657     6.30    64.79
         ================================================
         ID = 3 (0032):    24.43   2.128     6.00    58.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0022) |                                                  |
| IN= 2---> OUT= 1 |                                                  |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |    OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |     (cms)     (ha.m.)
                          0.0000     0.0000    |     0.6510     0.4564
                          0.1220     0.0863    |     0.8770     0.7894
                          0.3620     0.1603    |     0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0032)     24.430     2.128      6.00      58.15
     OUTFLOW: ID= 1 (0022)     24.430     0.611      7.60      58.14

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 28.69
                TIME SHIFT OF PEAK FLOW         (min)= 96.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.4151

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| CALIB            |
| NASHYD    (0023) |   Area     (ha)=  10.18   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   0.968 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  39.678
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.448

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0025) |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.294 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  38.933
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.440

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0027) |   Area     (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.210 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  32.664
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.369

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0024) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.76         1.95
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     116.82        67.62
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.95 (ii)    6.39 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.55         0.33      1.876 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00       6.00
     RUNOFF VOLUME    (mm)=      87.50        42.95      74.58
     TOTAL RAINFALL   (mm)=      88.50        88.50      88.50
     RUNOFF COEFFICIENT   =       0.99         0.49       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.

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--------------------
| CALIB            |
| STANDHYD  (0062) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.61
```

Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		116.82	67.62	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.95 (ii)	6.39 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
			TOTALS	
PEAK FLOW	(cms)=	0.08	0.10	0.181 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	55.42
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	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 (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	0.968	6.00	39.68
+ ID2= 2 (0024):	6.71	1.876	6.00	74.58
ID = 3 (0028):	16.89	2.844	6.00	53.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	2.844	6.00	53.54
+ ID2= 2 (0025):	2.59	0.294	6.00	38.93
ID = 1 (0028):	19.48	3.137	6.00	51.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	3.137	6.00	51.60
+ ID2= 2 (0027):	1.61	0.210	6.00	32.66
ID = 3 (0028):	21.09	3.347	6.00	50.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	3.347	6.00	50.16
+ ID2= 2 (0062):	0.85	0.181	6.00	55.42
ID = 1 (0028):	21.94	3.528	6.00	50.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.611	7.60	58.14
+ ID2= 2 (0028):	21.94	3.528	6.00	50.36
ID = 3 (0029):	46.37	3.933	6.00	54.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	3.933	6.00	54.50
OUTFLOW: ID= 1 (0030)	46.370	0.796	8.20	54.50

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.25
TIME SHIFT OF PEAK FLOW (min)=132.00
MAXIMUM STORAGE USED (ha.m.)= 0.8045

CALIB
NASHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	2.21	3.083	3.54	6.083	15.93	9.08	3.10
0.167	2.21	3.167	3.54	6.167	15.93	9.17	3.10
0.250	2.21	3.250	3.54	6.250	15.93	9.25	3.10
0.333	2.21	3.333	3.54	6.333	15.93	9.33	3.10
0.417	2.21	3.417	3.54	6.417	15.93	9.42	3.10
0.500	2.21	3.500	3.54	6.500	15.93	9.50	3.10
0.583	2.21	3.583	3.54	6.583	7.08	9.58	3.10
0.667	2.21	3.667	3.54	6.667	7.08	9.67	3.10
0.750	2.21	3.750	3.54	6.750	7.08	9.75	3.10
0.833	2.21	3.833	3.54	6.833	7.08	9.83	3.10
0.917	2.21	3.917	3.54	6.917	7.08	9.92	3.10
1.000	2.21	4.000	3.54	7.000	7.08	10.00	3.10
1.083	2.21	4.083	5.31	7.083	5.31	10.08	1.77
1.167	2.21	4.167	5.31	7.167	5.31	10.17	1.77
1.250	2.21	4.250	5.31	7.250	5.31	10.25	1.77
1.333	2.21	4.333	5.31	7.333	5.31	10.33	1.77
1.417	2.21	4.417	5.31	7.417	5.31	10.42	1.77
1.500	2.21	4.500	5.31	7.500	5.31	10.50	1.77
1.583	2.21	4.583	7.08	7.583	5.31	10.58	1.77
1.667	2.21	4.667	7.08	7.667	5.31	10.67	1.77
1.750	2.21	4.750	7.08	7.750	5.31	10.75	1.77
1.833	2.21	4.833	7.08	7.833	5.31	10.83	1.77
1.917	2.21	4.917	7.08	7.917	5.31	10.92	1.77
2.000	2.21	5.000	7.08	8.000	5.31	11.00	1.77
2.083	2.65	5.083	10.62	8.083	3.10	11.08	1.77
2.167	2.65	5.167	10.62	8.167	3.10	11.17	1.77
2.250	2.65	5.250	10.62	8.250	3.10	11.25	1.77
2.333	2.65	5.333	10.62	8.333	3.10	11.33	1.77
2.417	2.65	5.417	10.62	8.417	3.10	11.42	1.77
2.500	2.65	5.500	10.62	8.500	3.10	11.50	1.77
2.583	2.65	5.583	42.48	8.583	3.10	11.58	1.77
2.667	2.65	5.667	42.48	8.667	3.10	11.67	1.77
2.750	2.65	5.750	42.48	8.750	3.10	11.75	1.77
2.833	2.65	5.833	116.82	8.833	3.10	11.83	1.77
2.917	2.65	5.917	116.82	8.917	3.10	11.92	1.77
3.000	2.65	6.000	116.82	9.000	3.10	12.00	1.77

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW	(cms)=	0.202 (i)
TIME TO PEAK	(hrs)=	6.000
RUNOFF VOLUME	(mm)=	39.962
TOTAL RAINFALL	(mm)=	88.500
RUNOFF COEFFICIENT	=	0.452

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

| STANDHYD (0004) | Area (ha)= 1.45
|ID= 1 DT=12.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.93	0.52
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	2.21	3.200	3.54	6.200	15.93	9.20	3.10
0.400	2.21	3.400	3.54	6.400	15.93	9.40	3.10
0.600	2.21	3.600	3.54	6.600	11.51	9.60	3.10
0.800	2.21	3.800	3.54	6.800	7.08	9.80	3.10
1.000	2.21	4.000	3.54	7.000	7.08	10.00	3.10
1.200	2.21	4.200	5.31	7.200	5.31	10.20	1.77
1.400	2.21	4.400	5.31	7.400	5.31	10.40	1.77
1.600	2.21	4.600	6.19	7.600	5.31	10.60	1.77
1.800	2.21	4.800	7.08	7.800	5.31	10.80	1.77
2.000	2.21	5.000	7.08	8.000	5.31	11.00	1.77
2.200	2.65	5.200	10.62	8.200	3.10	11.20	1.77
2.400	2.65	5.400	10.62	8.400	3.10	11.40	1.77
2.600	2.65	5.600	26.55	8.600	3.10	11.60	1.77
2.800	2.65	5.800	61.06	8.800	3.10	11.80	1.77
3.000	2.66	6.000	116.82	9.000	3.10	12.00	1.77

			TOTALS
Max.Eff.Inten.(mm/hr)=	116.82	67.62	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.95 (ii)	6.39 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
PEAK FLOW (cms)=	0.30	0.09	0.390 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	87.50	42.95	71.46
TOTAL RAINFALL (mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT =	0.99	0.49	0.81

***** 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 (0063) | Area (ha)= 3.62
|ID= 1 DT=12.0 min | Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.01	2.61
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

			TOTALS
Max.Eff.Inten.(mm/hr)=	116.82	67.62	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.95 (ii)	6.39 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
PEAK FLOW (cms)=	0.33	0.44	0.771 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	87.50	42.95	55.42
TOTAL RAINFALL (mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT =	0.99	0.49	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 (0007) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.390	6.00	71.46
+ ID2= 2 (0005):	1.33	0.202	6.00	39.96
ID = 3 (0007):	2.78	0.591	6.00	56.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0007) |
| 3 + 2 = 1 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.591	6.00	56.65
+ ID2= 2 (0063):	3.62	0.771	6.00	55.42
ID = 1 (0007):	6.40	1.362	6.00	56.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR (0033)
| IN= 2---> OUT= 1
| DT= 5.0 min |

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	1.362	6.00	56.18
OUTFLOW: ID= 1 (0033)	6.400	0.108	6.83	56.09

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.94
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 0.2264

| ROUTE PIPE (0034)
| IN= 2---> OUT= 1
| DT= 5.0 min |

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.11	6.83	56.09	0.14	1.04
OUTFLOW: ID= 1 (0034)	6.40	0.11	7.08	56.08	0.14	1.03

| CALIB
| NASHYD (0035) | Area (ha)= 8.03 Curve Number (CN)= 74.0
|ID= 1 DT=12.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

```
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   1.394

     PEAK FLOW       (cms)=   0.910 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  38.933
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.440

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0037) |   Area     (ha)=  10.64   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

     Unit Hyd Qpeak  (cms)=   1.693

     PEAK FLOW       (cms)=   1.127 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  39.313
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.444

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0038) |   Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.208 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  39.577
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.447

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0036) |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.97          7.01
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     116.82         67.62
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      0.95 (ii)     6.39 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      3.56          1.19          4.748 (iii)
     TIME TO PEAK    (hrs)=      6.00          6.00           6.00
     RUNOFF VOLUME    (mm)=     87.50         42.95          70.12
     TOTAL RAINFALL   (mm)=     88.50         88.50          88.50
     RUNOFF COEFFICIENT   =      0.99          0.49           0.79

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0039) |   Area     (ha)=   1.21
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.67          0.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     116.82         67.62
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      0.95 (ii)     6.39 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.22          0.09          0.308 (iii)
     TIME TO PEAK    (hrs)=      6.00          6.00           6.00
     RUNOFF VOLUME    (mm)=     87.50         42.95          67.45
     TOTAL RAINFALL   (mm)=     88.50         88.50          88.50
     RUNOFF COEFFICIENT   =      0.99          0.49           0.76

***** 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.

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--------------------
| DUHYD     (0074) |
| Inlet Cap.=0.169 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |       AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.21      0.31      6.00   67.45
     ==========================================================
     MAJOR SYS.(ID= 2):   0.15      0.14      6.00   67.45
     MINOR SYS.(ID= 3):   1.06      0.17      6.00   67.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0047) |   Area     (ha)=   1.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.96          0.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     116.82         67.62
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      0.95 (ii)     6.39 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.31          0.09          0.403 (iii)
     TIME TO PEAK    (hrs)=      6.00          6.00           6.00
     RUNOFF VOLUME    (mm)=     87.50         42.95          71.46
     TOTAL RAINFALL   (mm)=     88.50         88.50          88.50
     RUNOFF COEFFICIENT   =      0.99          0.49           0.81

***** 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.

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--------------------
| DUHYD     (0072) |
| Inlet Cap.=0.363 |
| #of Inlets=    1 |
| Total(cms)=  0.4 |       AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.50      0.40      6.00   71.46
     ==========================================================
     MAJOR SYS.(ID= 2):   0.04      0.04      6.00   71.46
     MINOR SYS.(ID= 3):   1.46      0.36      6.00   71.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0035):     8.03   0.910     6.00    38.93
       + ID2= 2 (0036):    17.98   4.748     6.00    70.12
         ================================================
         ID = 3 (0040):    26.01   5.658     6.00    60.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0040):    26.01   5.658     6.00    60.49
       + ID2= 2 (0037):    10.64   1.127     6.00    39.31
         ================================================
         ID = 1 (0040):    36.65   6.785     6.00    54.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0040):    36.65   6.785     6.00    54.35
       + ID2= 2 (0038):     2.11   0.208     6.00    39.58
         ================================================
         ID = 3 (0040):    38.76   6.993     6.00    53.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0040):    38.76   6.993     6.00    53.54
       + ID2= 2 (0072):     0.04   0.040     6.00    71.46
         ================================================
         ID = 1 (0040):    38.80   7.033     6.00    53.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0040):    38.80   7.033     6.00    53.56
       + ID2= 2 (0074):     0.15   0.139     6.00    67.45
         ================================================
         ID = 3 (0040):    38.95   7.172     6.00    53.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0041) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0034):     6.40   0.107     7.08    56.08
       + ID2= 2 (0040):    38.95   7.172     6.00    53.61
         ================================================
         ID = 3 (0041):    45.35   7.208     6.00    54.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |   OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |    (cms)     (ha.m.)
                        0.0000     0.0000    |   3.1150      0.9004
                        1.2740     0.5550    |   3.6250      1.1600
                        2.2650     0.7154    |   3.9640      1.3570

                                    AREA     QPEAK     TPEAK      R.V.
                                    (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0041)        45.349     7.208      6.00     54.22
     OUTFLOW: ID= 1 (0043)        45.349     2.610      6.25     54.22

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 36.21
                  TIME SHIFT OF PEAK FLOW          (min)= 15.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.7934

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--------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.357 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  25.463
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.288

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.242 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  39.141
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.442

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71          3.45
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n          =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=     116.82         67.62
           over (min)           12.00         12.00
     Storage Coeff.  (min)=       0.95 (ii)     6.39 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       2.18          0.59        2.761 (iii)
     TIME TO PEAK    (hrs)=       6.00          6.00         6.00
     RUNOFF VOLUME    (mm)=      87.50         42.95        72.35
     TOTAL RAINFALL   (mm)=      88.50         88.50        88.50
     RUNOFF COEFFICIENT   =       0.99          0.49         0.82

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
```

Surface Area	(ha)=	0.86	0.41
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		116.82	67.62
over (min)		12.00	12.00
Storage Coeff. (min)=		0.95 (ii)	6.39 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.28	0.07	0.349 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	73.24
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.83

***** 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.

DUHYD (0069)		AREA	QPEAK	TPEAK	R.V.
Inlet Cap.=0.320		(ha)	(cms)	(hrs)	(mm)
#of Inlets= 1					
Total(cms)= 0.3					
TOTAL HYD.(ID= 1):		1.27	0.35	6.00	73.24
MAJOR SYS.(ID= 2):		0.03	0.03	6.00	73.24
MINOR SYS.(ID= 3):		1.24	0.32	6.00	73.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0070) | Area (ha)= 2.50
ID= 1 DT=12.0 min | Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.38	1.12
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		116.82	67.62
over (min)		12.00	12.00
Storage Coeff. (min)=		0.95 (ii)	6.39 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.45	0.19	0.637 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	67.45
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.76

***** 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.

DUHYD (0071)		AREA	QPEAK	TPEAK	R.V.
Inlet Cap.=0.550		(ha)	(cms)	(hrs)	(mm)
#of Inlets= 1					
Total(cms)= 0.6					
TOTAL HYD.(ID= 1):		2.50	0.64	6.00	67.45
MAJOR SYS.(ID= 2):		0.09	0.09	6.00	67.45
MINOR SYS.(ID= 3):		2.41	0.55	6.00	67.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0044):		3.28	0.357	6.00	25.46
+ ID2= 2 (0045):		10.16	2.761	6.00	72.35
ID = 3 (0048):		13.44	3.119	6.00	60.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0048):		13.44	3.119	6.00	60.91
+ ID2= 2 (0046):		2.21	0.242	6.00	39.14
ID = 1 (0048):		15.65	3.361	6.00	57.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0048):		15.65	3.361	6.00	57.83
+ ID2= 2 (0069):		1.24	0.320	6.00	73.24
ID = 3 (0048):		16.89	3.681	6.00	58.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0048):		16.89	3.681	6.00	58.97
+ ID2= 2 (0071):		2.41	0.550	6.00	67.45
ID = 1 (0048):		19.30	4.231	6.00	60.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0048):		19.30	4.231	6.00	60.02
+ ID2= 2 (0072):		1.46	0.363	6.00	71.46
ID = 3 (0048):		20.76	4.594	6.00	60.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.9630	0.3823
0.5430	0.1233	1.3030	0.6907
0.7650	0.2343	1.5860	1.0977

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)		20.758	4.594	6.00	60.83
OUTFLOW: ID= 1 (0049)		20.758	1.074	6.20	60.83

PEAK FLOW REDUCTION [Qout/Qin](%)= 23.37
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.4845

```
-------------------
| ROUTE PIPE (0050)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 467.00
-------------------     Slope      (m/m)=  0.006
                        Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE    VELOCITY    TRAV.TIME
         (m)      (cu.m.)       (cms)        (m/s)        min
        0.09     .201E+02        0.0         0.88         8.87
        0.17     .560E+02        0.2         1.37         5.68
        0.26     .101E+03        0.4         1.76         4.42
        0.35     .153E+03        0.7         2.09         3.72
        0.43     .210E+03        1.1         2.38         3.27
        0.52     .270E+03        1.5         2.64         2.95
        0.61     .334E+03        2.0         2.86         2.72
        0.69     .399E+03        2.6         3.06         2.55
        0.78     .466E+03        3.2         3.23         2.41
        0.87     .533E+03        3.9         3.38         2.31
        0.96     .599E+03        4.5         3.50         2.22
        1.04     .665E+03        5.1         3.60         2.16
        1.13     .728E+03        5.7         3.68         2.11
        1.22     .789E+03        6.3         3.74         2.08
        1.30     .846E+03        6.8         3.76         2.07
        1.39     .897E+03        7.2         3.76         2.07
        1.48     .943E+03        7.5         3.72         2.09
        1.56     .978E+03        7.6         3.63         2.15
        1.65     .999E+03        7.1         3.30         2.36
                                <---- hydrograph ---->   <-pipe / channel->
                          AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                          (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0049)   20.76     1.07    6.20  60.83      0.43      2.39
     OUTFLOW: ID= 1 (0050)   20.76     1.08    6.30  60.83      0.43      2.38
```

```
-------------------
| CALIB             |
| NASHYD    (0054)  |   Area     (ha)=   1.34   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.233

     PEAK FLOW       (cms)=   0.152 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  38.933
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.440

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB             |
| NASHYD    (0056)  |   Area     (ha)=   0.10   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.05

     Unit Hyd Qpeak  (cms)=   0.076

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=   3.471
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.039

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB             |
| NASHYD    (0058)  |   Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.239 (i)
     TIME TO PEAK    (hrs)=   6.000
     RUNOFF VOLUME    (mm)=  39.678
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.448

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------
| CALIB             |
| STANDHYD  (0057)  |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min  |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        0.33          0.14
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      116.82         67.62
               over (min)        12.00         12.00
     Storage Coeff.  (min)=        0.95 (ii)     6.39 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.11          0.02          0.131 (iii)
     TIME TO PEAK    (hrs)=        6.00          6.00          6.00
     RUNOFF VOLUME    (mm)=       87.50         42.95         74.12
     TOTAL RAINFALL   (mm)=       88.50         88.50         88.50
     RUNOFF COEFFICIENT   =        0.99          0.49          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.
```

```
-------------------
| ADD HYD   (0073)  |
|  1 +  2 =  3      |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0057):     0.47   0.131     6.00    74.12
        + ID2= 2 (0058):     2.51   0.239     6.00    39.68
          ================================================
          ID = 3 (0073):     2.98   0.369     6.00    45.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| DUHYD     (0066)  |
| Inlet Cap.=0.181  |
| #of Inlets=    1  |
| Total(cms)=  0.2  |       AREA     QPEAK     TPEAK    R.V.
-------------------            (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.98      0.37      6.00   45.11
     ================================================
     MAJOR SYS.(ID= 2):   0.39      0.19      6.00   45.11
     MINOR SYS.(ID= 3):   2.59      0.18      6.00   45.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| CALIB             |
| STANDHYD  (0053)  |   Area     (ha)=   5.86
|ID= 1 DT=12.0 min  |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        3.28          2.58
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      116.82         67.62
               over (min)        12.00         12.00
     Storage Coeff.  (min)=        0.95 (ii)     6.39 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        1.06          0.44          1.502 (iii)
     TIME TO PEAK    (hrs)=        6.00          6.00          6.00
     RUNOFF VOLUME    (mm)=       87.50         42.95         67.90
     TOTAL RAINFALL   (mm)=       88.50         88.50         88.50
     RUNOFF COEFFICIENT   =        0.99          0.49          0.77
```

***** 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 (0055) ID= 1 DT=12.0 min | Area (ha)= 2.71 Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		116.82	67.62	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	0.95 (ii)	6.39 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.22	0.34	0.564 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	54.08
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.61

***** 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 (0065) ID= 1 DT=12.0 min | Area (ha)= 2.71 Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		116.82	67.62	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	0.95 (ii)	6.39 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.22	0.34	0.564 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	87.50	42.95	54.08
TOTAL RAINFALL	(mm)=	88.50	88.50	88.50
RUNOFF COEFFICIENT	=	0.99	0.49	0.61

***** 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 (0051) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0053):	5.86	1.502	6.00	67.90
+ ID2= 2 (0054):	1.34	0.152	6.00	38.93
ID = 3 (0051):	7.20	1.654	6.00	62.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):	7.20	1.654	6.00	62.51
+ ID2= 2 (0055):	2.71	0.564	6.00	54.08
ID = 1 (0051):	9.91	2.218	6.00	60.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0051):	9.91	2.218	6.00	60.20
+ ID2= 2 (0056):	0.10	0.002	6.00	3.47
ID = 3 (0051):	10.01	2.220	6.00	59.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):	10.01	2.220	6.00	59.64
+ ID2= 2 (0065):	2.71	0.564	6.00	54.08
ID = 1 (0051):	12.72	2.784	6.00	58.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0051):	12.72	2.784	6.00	58.45
+ ID2= 2 (0066):	2.59	0.181	6.00	45.11
ID = 3 (0051):	15.31	2.965	6.00	56.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):	15.31	2.965	6.00	56.19
+ ID2= 2 (0069):	0.03	0.029	6.00	73.24
ID = 1 (0051):	15.34	2.994	6.00	56.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0050):	20.76	1.075	6.30	60.83
+ ID2= 2 (0051):	15.34	2.994	6.00	56.23
ID = 3 (0060):	36.10	3.858	6.00	58.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061) IN= 2---> OUT= 1 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.5100	0.3577

```
                          0.2970     0.1233   |   0.6800      0.7154
                          0.4250     0.2220   |   0.7930      1.1964

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0060)        36.100     3.858      6.00      58.89
     OUTFLOW: ID= 1 (0061)        36.100     0.725      8.20      58.88

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.78
                    TIME SHIFT OF PEAK FLOW          (min)=132.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.9052

--------------------------------------------------------------------------------

 FINISH
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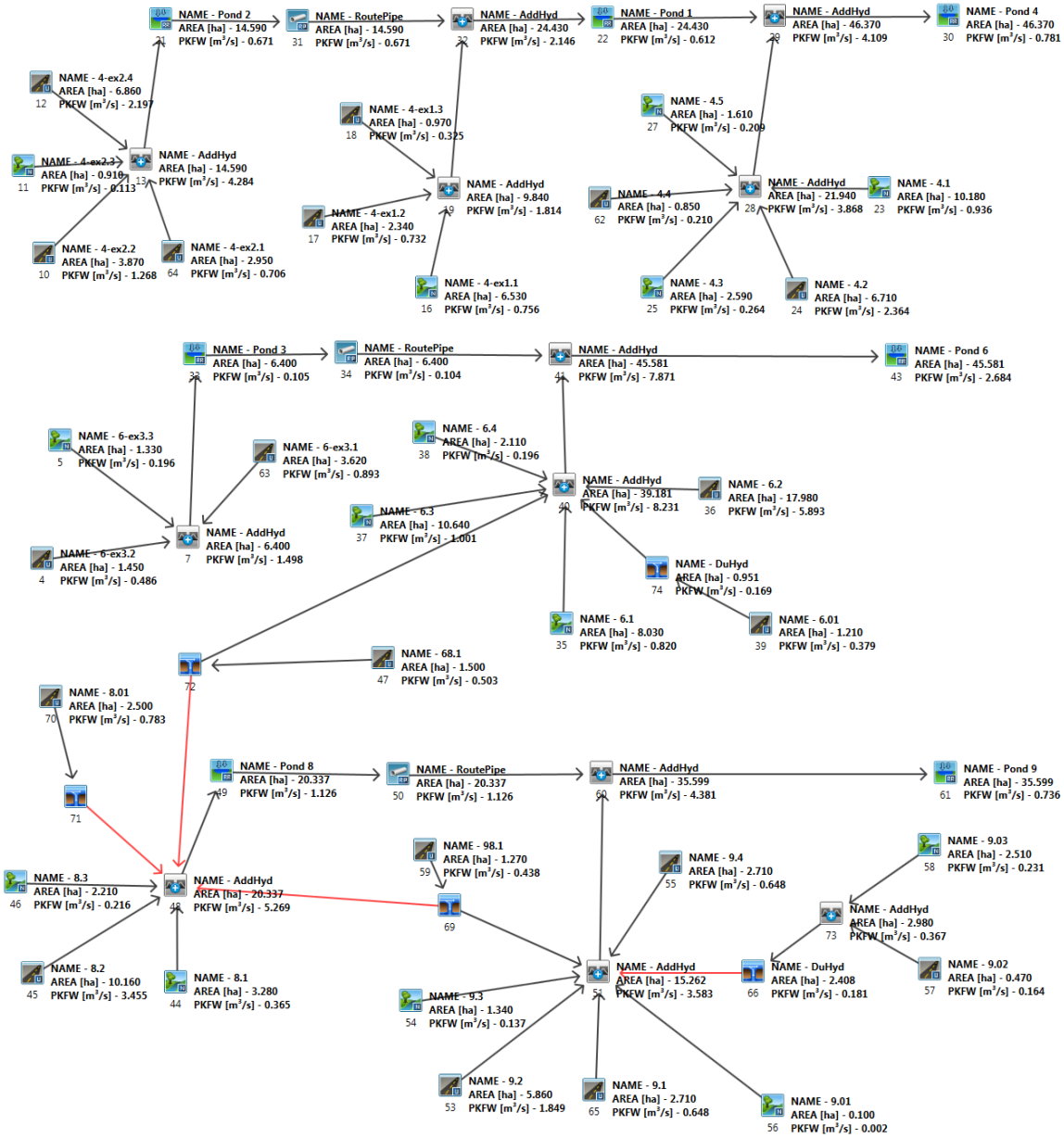
L09-301
Glenway Golf Course Development, Newmarket, ON
4 Hour Chicago Storm Pre-Development Model Schematic
July 2013

VO2 Model Schematic



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        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O    Company
        OOO     T      T    H   H    Y    M   M   OOO               Serial

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                    *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual Otthymo 3.0\VO2\voin.dat
  Output  filename: C:\Users\DMcBrayne\AppData\Local\Temp\8b85d6c4-f183-44da-bac0-
ea2c676881e9\Scenario.out
  Summary filename: C:\Users\DMcBrayne\AppData\Local\Temp\8b85d6c4-f183-44da-bac0-
ea2c676881e9\Scenario.sum


DATE: 07/26/2013                          TIME: 02:09:41

USER:


COMMENTS: _____________________________________________________


-------------------------------------------------------------------------------------------------
-----
  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************

--------------------
| CHICAGO STORM    |     IDF curve parameters: A= 648.000
| Ptotal= 34.82 mm |                           B=   4.000
--------------------                           C=   0.784
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    = 10.00 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
              0.17    2.27  |  1.17   17.18  |'  2.17    5.25  |  3.17    2.69
              0.33    2.60  |  1.33   81.85  |'  2.33    4.49  |  3.33    2.50
              0.50    3.04  |  1.50   22.51  |'  2.50    3.93  |  3.50    2.34
              0.67    3.72  |  1.67   11.87  |'  2.67    3.51  |  3.67    2.21
              0.83    4.86  |  1.83    8.23  |'  2.83    3.18  |  3.83    2.08
              1.00    7.30  |  2.00    6.38  |'  3.00    2.91  |  4.00    1.98


-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0011) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

        NOTE:  RAINFALL WAS TRANSFORMED TO  12.0 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
             0.200    2.33  | 1.200   27.96  |' 2.200    5.12  |  3.20    2.66
             0.400    2.75  | 1.400   62.07  |' 2.400    4.30  |  3.40    2.45
             0.600    3.38  | 1.600   17.19  |' 2.600    3.72  |  3.60    2.28
             0.800    4.48  | 1.800    9.44  |' 2.800    3.29  |  3.80    2.12
             1.000    6.89  | 2.000    6.69  |' 3.000    2.96  |  4.00    1.99

    Unit Hyd Qpeak  (cms)=   0.204

    PEAK FLOW       (cms)=   0.020 (i)
    TIME TO PEAK    (hrs)=   1.400
    RUNOFF VOLUME    (mm)=   6.834
    TOTAL RAINFALL   (mm)=  34.816
    RUNOFF COEFFICIENT   =   0.196

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0010) |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
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                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      2.36         1.51
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n            =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=     62.07        15.76
              over (min)       12.00        12.00
    Storage Coeff.  (min)=      1.22 (ii)   10.97 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=      0.14         0.09
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.41         0.05        0.454 (iii)
    TIME TO PEAK    (hrs)=      1.40         1.40         1.40
    RUNOFF VOLUME    (mm)=     33.82         9.06        24.16
    TOTAL RAINFALL   (mm)=     34.82        34.82        34.82
    RUNOFF COEFFICIENT   =      0.97         0.26         0.69

***** 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.

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| CALIB            |
| STANDHYD  (0012) |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------

                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      4.18         2.68
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=    213.85        20.00
    Mannings n            =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=     62.07        15.76
              over (min)       12.00        24.00
    Storage Coeff.  (min)=      3.96 (ii)   13.71 (ii)
    Unit Hyd. Tpeak (min)=     12.00        24.00
    Unit Hyd. peak  (cms)=      0.13         0.06
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.70         0.07        0.739 (iii)
    TIME TO PEAK    (hrs)=      1.40         1.60         1.40
    RUNOFF VOLUME    (mm)=     33.82         9.06        24.16
    TOTAL RAINFALL   (mm)=     34.82        34.82        34.82
    RUNOFF COEFFICIENT   =      0.97         0.26         0.69

***** 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.

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| CALIB            |
| STANDHYD  (0064) |   Area     (ha)=   2.95
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------

                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      0.74         2.21
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n            =     0.013        0.250
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Max.Eff.Inten.(mm/hr)=	62.07	15.76	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.22 (ii)	10.97 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.09	
			TOTALS
PEAK FLOW (cms)=	0.13	0.07	0.196 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	33.82	9.06	15.24
TOTAL RAINFALL (mm)=	34.82	34.82	34.82
RUNOFF COEFFICIENT =	0.97	0.26	0.44

***** 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 (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.454	1.40	24.16
+ ID2= 2 (0011):	0.91	0.020	1.40	6.83
ID = 3 (0013):	4.78	0.474	1.40	20.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	0.474	1.40	20.86
+ ID2= 2 (0012):	6.86	0.739	1.40	24.16
ID = 1 (0013):	11.64	1.213	1.40	22.80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	1.213	1.40	22.80
+ ID2= 2 (0064):	2.95	0.196	1.40	15.24
ID = 3 (0013):	14.59	1.409	1.40	21.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	1.409	1.40	21.28
OUTFLOW: ID= 1 (0021)	14.590	0.275	1.90	21.26

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.51
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.1740

ROUTE PIPE (0031)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.27	1.90	21.26	0.23	1.45
OUTFLOW: ID= 1 (0031)	14.59	0.27	1.90	21.26	0.23	1.45

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.134 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 7.029
TOTAL RAINFALL (mm)= 34.816
RUNOFF COEFFICIENT = 0.202

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.62	0.35
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	62.07	15.76
over (min)	12.00	12.00
Storage Coeff. (min)=	1.22 (ii)	10.97 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.09
		TOTALS
PEAK FLOW (cms)=	0.11	0.01 0.118 (iii)
TIME TO PEAK (hrs)=	1.40	1.40 1.40
RUNOFF VOLUME (mm)=	33.82	9.06 24.90
TOTAL RAINFALL (mm)=	34.82	34.82 34.82
RUNOFF COEFFICIENT =	0.97	0.26 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.

CALIB
STANDHYD (0017)
ID= 1 DT=12.0 min

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

IMPERVIOUS PERVIOUS (i)

Surface Area	(ha)=	1.29	1.05	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	62.07	15.76	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.22 (ii)	10.97 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.09	
				TOTALS
PEAK FLOW	(cms)=	0.22	0.03	0.255 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	33.82	9.06	22.67
TOTAL RAINFALL	(mm)=	34.82	34.82	34.82
RUNOFF COEFFICIENT	=	0.97	0.26	0.65

***** 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 (0019)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.134	1.40	7.03
+ ID2= 2 (0017):	2.34	0.255	1.40	22.67
ID = 3 (0019):	8.87	0.388	1.40	11.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	0.388	1.40	11.16
+ ID2= 2 (0018):	0.97	0.118	1.40	24.90
ID = 1 (0019):	9.84	0.506	1.40	12.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	0.506	1.40	12.51
+ ID2= 2 (0031):	14.59	0.274	1.90	21.26
ID = 3 (0032):	24.43	0.576	1.40	17.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	0.576	1.40	17.74
OUTFLOW: ID= 1 (0022)	24.430	0.260	2.80	17.73

PEAK FLOW REDUCTION [Qout/Qin](%)= 45.13
TIME SHIFT OF PEAK FLOW (min)= 84.00
MAXIMUM STORAGE USED (ha.m.)= 0.1289

CALIB
NASHYD (0023)
ID= 1 DT=12.0 min

Area (ha)= 10.18 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 1.440

PEAK FLOW (cms)= 0.180 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 7.340
TOTAL RAINFALL (mm)= 34.816
RUNOFF COEFFICIENT = 0.211

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0025)
ID= 1 DT=12.0 min

Area (ha)= 2.59 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.048 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 7.202
TOTAL RAINFALL (mm)= 34.816
RUNOFF COEFFICIENT = 0.207

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0027)
ID= 1 DT=12.0 min

Area (ha)= 1.61 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.038 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 6.042
TOTAL RAINFALL (mm)= 34.816
RUNOFF COEFFICIENT = 0.174

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0024)
ID= 1 DT=12.0 min

Area (ha)= 6.71
Total Imp(%)= 71.00 Dir. Conn.(%)= 71.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.76	1.95	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	62.07	15.76	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.22 (ii)	10.97 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.09	
				TOTALS
PEAK FLOW	(cms)=	0.82	0.06	0.882 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	33.82	9.06	26.63
TOTAL RAINFALL	(mm)=	34.82	34.82	34.82
RUNOFF COEFFICIENT	=	0.97	0.26	0.77

***** 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 (0062)

Area (ha)= 0.85

|ID= 1 DT=12.0 min | Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.61
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	62.07	15.76
over (min)	12.00	12.00
Storage Coeff. (min)=	1.22 (ii)	10.97 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.09

	TOTALS
PEAK FLOW (cms)=	0.060 (iii)
TIME TO PEAK (hrs)=	1.40
RUNOFF VOLUME (mm)=	15.98
TOTAL RAINFALL (mm)=	34.82
RUNOFF COEFFICIENT =	0.46

***** 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 (0028)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0023):	10.18	0.180	1.60	7.34
	+ ID2= 2 (0024):	6.71	0.882	1.40	26.63
	ID = 3 (0028):	16.89	1.022	1.40	15.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0028):	16.89	1.022	1.40	15.01
	+ ID2= 2 (0025):	2.59	0.048	1.60	7.20
	ID = 1 (0028):	19.48	1.069	1.40	13.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0028):	19.48	1.069	1.40	13.97
	+ ID2= 2 (0027):	1.61	0.038	1.40	6.04
	ID = 3 (0028):	21.09	1.107	1.40	13.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0028):	21.09	1.107	1.40	13.36
	+ ID2= 2 (0062):	0.85	0.060	1.40	15.98
	ID = 1 (0028):	21.94	1.167	1.40	13.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0022):	24.43	0.260	2.80	17.73
	+ ID2= 2 (0028):	21.94	1.167	1.40	13.46
	ID = 3 (0029):	46.37	1.219	1.40	15.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1	0.0000	0.0000	1.3030	1.3940
DT= 5.0 min	0.4380	0.4440	1.5000	1.8008
	0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	1.219	1.40	15.71
OUTFLOW: ID= 1 (0030)	46.370	0.272	4.00	15.71

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.31
TIME SHIFT OF PEAK FLOW (min)=156.00
MAXIMUM STORAGE USED (ha.m.)= 0.2758

CALIB					
NASHYD (0005)	Area (ha)=	1.33	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)=	0.13			

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	2.27	1.083	17.18	2.083	5.25	3.08	2.69
0.167	2.27	1.167	17.18	2.167	5.25	3.17	2.69
0.250	2.60	1.250	81.85	2.250	4.49	3.25	2.50
0.333	2.60	1.333	81.85	2.333	4.49	3.33	2.50
0.417	3.04	1.417	22.51	2.417	3.93	3.42	2.34
0.500	3.04	1.500	22.51	2.500	3.93	3.50	2.34
0.583	3.72	1.583	11.87	2.583	3.51	3.58	2.21
0.667	3.72	1.667	11.87	2.667	3.51	3.67	2.21
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.917	7.30	1.917	6.38	2.917	2.91	3.92	1.98
1.000	7.30	2.000	6.38	3.000	2.91	4.00	1.98

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW	(cms)=	0.036 (i)
TIME TO PEAK	(hrs)=	1.417
RUNOFF VOLUME	(mm)=	7.393
TOTAL RAINFALL	(mm)=	34.816
RUNOFF COEFFICIENT	=	0.212

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0004)	Area (ha)=	1.45		
ID= 1 DT=12.0 min	Total Imp(%)=	64.00	Dir. Conn.(%)=	64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.93	0.52
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	2.33	1.200	27.96	2.200	5.12	3.20	2.66
0.400	2.75	1.400	62.07	2.400	4.30	3.40	2.45
0.600	3.38	1.600	17.19	2.600	3.72	3.60	2.28
0.800	4.48	1.800	9.44	2.800	3.29	3.80	2.12

```
                1.000    6.89 | 2.000    6.69 | 3.000    2.96 |  4.00    1.99

     Max.Eff.Inten.(mm/hr)=      62.07        15.76
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.22 (ii)   10.97 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.02          0.176 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      33.82         9.06          24.90
     TOTAL RAINFALL   (mm)=      34.82        34.82          34.82
     RUNOFF COEFFICIENT   =       0.97         0.26           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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0063) |   Area    (ha)=   3.62
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.01         2.61
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      62.07        15.76
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.22 (ii)   10.97 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.08          0.256 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      33.82         9.06          15.99
     TOTAL RAINFALL   (mm)=      34.82        34.82          34.82
     RUNOFF COEFFICIENT   =       0.97         0.26           0.46

***** 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   (0007) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0004):     1.45   0.176     1.40    24.90
        + ID2= 2 (0005):     1.33   0.036     1.42     7.39
          ================================================
          ID = 3 (0007):     2.78   0.202     1.42    16.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0007) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 3 (0007):     2.78   0.202     1.42    16.52
        + ID2= 2 (0063):     3.62   0.256     1.40    15.99
          ================================================
          ID = 1 (0007):     6.40   0.445     1.42    16.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0033) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------          (cms)     (ha.m.)  |    (cms)     (ha.m.)
                              0.0000     0.0000  |   0.3260     0.8017
                              0.0790     0.1850  |   0.3960     0.9004
                              0.2270     0.3947  |   0.0000     0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0007)       6.400     0.445      1.42      16.22
     OUTFLOW: ID= 1 (0033)       6.400     0.032      3.00      16.12

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.23
                    TIME SHIFT OF PEAK FLOW          (min)= 95.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.0753

--------------------------------------------------------------------------------
--------------------
| ROUTE PIPE (0034)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter     (mm)=1650.00
| DT=  5.0 min     |     Length        (m)= 850.00
--------------------     Slope       (m/m)=  0.005
                         Manning n         =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)     (cu.m.)       (cms)         (m/s)        min
        0.09    .367E+02        0.0          0.80        17.68
        0.17    .102E+03        0.1          1.25        11.33
        0.26    .184E+03        0.3          1.61         8.81
        0.35    .278E+03        0.6          1.91         7.41
        0.43    .382E+03        1.0          2.18         6.51
        0.52    .492E+03        1.4          2.41         5.88
        0.61    .608E+03        1.9          2.61         5.43
        0.69    .727E+03        2.4          2.79         5.08
        0.78    .848E+03        2.9          2.95         4.81
        0.87    .970E+03        3.5          3.08         4.60
        0.96    .109E+04        4.1          3.20         4.43
        1.04    .121E+04        4.7          3.29         4.31
        1.13    .133E+04        5.2          3.36         4.22
        1.22    .144E+04        5.8          3.41         4.15
        1.30    .154E+04        6.2          3.44         4.12
        1.39    .163E+04        6.6          3.43         4.13
        1.48    .172E+04        6.9          3.40         4.17
        1.56    .178E+04        6.9          3.31         4.28
        1.65    .182E+04        6.5          3.02         4.70
                                     <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0033)     6.40     0.03    3.00  16.12       0.08      0.80
     OUTFLOW: ID= 1 (0034)     6.40     0.03    3.42  16.12       0.08      0.80

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0035) |   Area     (ha)=   8.03   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   1.394

     PEAK FLOW       (cms)=   0.150 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=   7.202
     TOTAL RAINFALL   (mm)=  34.816
     RUNOFF COEFFICIENT   =   0.207

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0037) |   Area     (ha)=  10.64   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

     Unit Hyd Qpeak  (cms)=   1.693

     PEAK FLOW       (cms)=   0.196 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=   7.273
     TOTAL RAINFALL   (mm)=  34.816
     RUNOFF COEFFICIENT   =   0.209

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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```
| CALIB                |
| NASHYD    (0038)     |   Area     (ha)=   2.11   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
                       |   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.038 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=   7.321
     TOTAL RAINFALL   (mm)=  34.816
     RUNOFF COEFFICIENT   =   0.210

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| CALIB                |
| STANDHYD  (0036)     |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     10.97          7.01
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=     62.07         15.76
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      1.22 (ii)    10.97 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.09
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.89          0.22      2.109 (iii)
     TIME TO PEAK    (hrs)=      1.40          1.40      1.40
     RUNOFF VOLUME    (mm)=     33.82          9.06     24.16
     TOTAL RAINFALL   (mm)=     34.82         34.82     34.82
     RUNOFF COEFFICIENT   =      0.97          0.26      0.69

***** 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  (0039)     |   Area     (ha)=   1.21
|ID= 1 DT=12.0 min     |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.67          0.54
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=     62.07         15.76
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      1.22 (ii)    10.97 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.09
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.11          0.02      0.132 (iii)
     TIME TO PEAK    (hrs)=      1.40          1.40      1.40
     RUNOFF VOLUME    (mm)=     33.82          9.06     22.67
     TOTAL RAINFALL   (mm)=     34.82         34.82     34.82
     RUNOFF COEFFICIENT   =      0.97          0.26      0.65

***** 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.
```

```
| DUHYD     (0074)     |
| Inlet Cap.=0.169     |
| #of Inlets=    1     |
| Total(cms)=  0.2     |
                          AREA     QPEAK     TPEAK    R.V.
                          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.21      0.13      1.40   22.67
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   1.21      0.13      1.40   22.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| CALIB                |
| STANDHYD  (0047)     |   Area     (ha)=   1.50
|ID= 1 DT=12.0 min     |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.96          0.54
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=     62.07         15.76
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      1.22 (ii)    10.97 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.09
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.17          0.02      0.182 (iii)
     TIME TO PEAK    (hrs)=      1.40          1.40      1.40
     RUNOFF VOLUME    (mm)=     33.82          9.06     24.90
     TOTAL RAINFALL   (mm)=     34.82         34.82     34.82
     RUNOFF COEFFICIENT   =      0.97          0.26      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.
```

```
| DUHYD     (0072)     |
| Inlet Cap.=0.363     |
| #of Inlets=    1     |
| Total(cms)=  0.4     |
                          AREA     QPEAK     TPEAK    R.V.
                          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.50      0.18      1.40   24.90
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   1.50      0.18      1.40   24.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| ADD HYD   (0040)     |
|   1 +  2 =  3        |
                          AREA     QPEAK     TPEAK      R.V.
                          (ha)     (cms)     (hrs)      (mm)
          ID1= 1 (0035):    8.03    0.150      1.60      7.20
        + ID2= 2 (0036):   17.98    2.109      1.40     24.16
          ================================================
          ID = 3 (0040):   26.01    2.252      1.40     18.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| ADD HYD   (0040)     |
|   3 +  2 =  1        |
                          AREA     QPEAK     TPEAK      R.V.
                          (ha)     (cms)     (hrs)      (mm)
          ID1= 3 (0040):   26.01    2.252      1.40     18.92
        + ID2= 2 (0037):   10.64    0.196      1.60      7.27
          ================================================
          ID = 1 (0040):   36.65    2.424      1.40     15.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
```

```
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0040):     36.65   2.424     1.40    15.54
       + ID2= 2 (0038):      2.11   0.038     1.60     7.32
         ================================================
         ID = 3 (0040):     38.76   2.454     1.40    15.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
         ID1= 3 (0040):     38.76   2.454     1.40    15.09
       + ID2= 2 (0072):      0.00   0.000     0.00     0.00
         ================================================
         ID = 1 (0040):     38.76   2.454     1.40    15.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0074 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
         ID1= 1 (0040):     38.76   2.454     1.40    15.09
       + ID2= 2 (0074):      0.00   0.000     0.00     0.00
         ================================================
         ID = 3 (0040):     38.76   2.454     1.40    15.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| ADD HYD   (0041) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0034):      6.40   0.032     3.42    16.12
       + ID2= 2 (0040):     38.76   2.454     1.40    15.09
         ================================================
         ID = 3 (0041):     45.16   2.345     1.42    15.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)     |    (cms)     (ha.m.)
                          0.0000     0.0000     |   3.1150      0.9004
                          1.2740     0.5550     |   3.6250      1.1600
                          2.2650     0.7154     |   3.9640      1.3570

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0041)     45.160     2.345     1.42       15.24
     OUTFLOW: ID= 1 (0043)     45.160     0.627     1.83       15.24

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 26.74
                   TIME SHIFT OF PEAK FLOW          (min)= 25.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=  0.2736
```

```
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.067 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=   4.711
     TOTAL RAINFALL   (mm)=  34.816
     RUNOFF COEFFICIENT   =   0.135

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.041 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=   7.241
     TOTAL RAINFALL   (mm)=  34.816
     RUNOFF COEFFICIENT   =   0.208

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71          3.45
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n            =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      62.07         15.76
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.22 (ii)    10.97 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.16          0.11        1.263 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40         1.40
     RUNOFF VOLUME    (mm)=      33.82          9.06        25.40
     TOTAL RAINFALL   (mm)=      34.82         34.82        34.82
     RUNOFF COEFFICIENT   =       0.97          0.26         0.73

***** 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  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.86          0.41
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n            =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      62.07         15.76
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.22 (ii)    10.97 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.15          0.01        0.162 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40         1.40
     RUNOFF VOLUME    (mm)=      33.82          9.06        25.89
     TOTAL RAINFALL   (mm)=      34.82         34.82        34.82
     RUNOFF COEFFICIENT   =       0.97          0.26         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.

DUHYD (0069)
Inlet Cap.=0.320
#of Inlets= 1
Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.16	1.40	25.89
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.27	0.16	1.40	25.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0070)
ID= 1 DT=12.0 min

Area (ha)= 2.50
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.38	1.12
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		62.07	15.76
over (min)		12.00	12.00
Storage Coeff. (min)=		1.22 (ii)	10.97 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.09

				TOTALS
PEAK FLOW	(cms)=	0.24	0.03	0.272 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	33.82	9.06	22.67
TOTAL RAINFALL	(mm)=	34.82	34.82	34.82
RUNOFF COEFFICIENT	=	0.97	0.26	0.65

***** 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.

DUHYD (0071)
Inlet Cap.=0.550
#of Inlets= 1
Total(cms)= 0.6

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.50	0.27	1.40	22.67
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.50	0.27	1.40	22.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0044):	3.28	0.067	1.40	4.71
+ ID2= 2 (0045):	10.16	1.263	1.40	25.40
ID = 3 (0048):	13.44	1.330	1.40	20.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	13.44	1.330	1.40	20.35
+ ID2= 2 (0046):	2.21	0.041	1.60	7.24
ID = 1 (0048):	15.65	1.368	1.40	18.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0048):	15.65	1.368	1.40	18.50
+ ID2= 2 (0069):	1.27	0.162	1.40	25.89
ID = 3 (0048):	16.92	1.529	1.40	19.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0048):	16.92	1.529	1.40	19.05
+ ID2= 2 (0071):	2.50	0.272	1.40	22.67
ID = 1 (0048):	19.42	1.801	1.40	19.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0048):	19.42	1.801	1.40	19.52
+ ID2= 2 (0072):	1.50	0.182	1.40	24.90
ID = 3 (0048):	20.92	1.984	1.40	19.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.9630	0.3823
0.5430	0.1233	1.3030	0.6907
0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.920	1.984	1.40	19.90
OUTFLOW: ID= 1 (0049)	20.920	0.640	1.60	19.90

PEAK FLOW REDUCTION [Qout/Qin](%)= 32.28
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.1724

ROUTE PIPE (0050)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 467.00
Slope (m/m)= 0.006
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08

1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.92	0.64	1.60	19.90	0.33	2.04
OUTFLOW: ID= 1 (0050)	20.92	0.64	1.70	19.90	0.33	2.04

CALIB
NASHYD (0054)
ID= 1 DT=12.0 min

Area (ha)= 1.34 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.025 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 7.202
TOTAL RAINFALL (mm)= 34.816
RUNOFF COEFFICIENT = 0.207

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0056)
ID= 1 DT=12.0 min

Area (ha)= 0.10 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.000 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 0.642
TOTAL RAINFALL (mm)= 34.816
RUNOFF COEFFICIENT = 0.018

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0058)
ID= 1 DT=12.0 min

Area (ha)= 2.51 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.044 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 7.340
TOTAL RAINFALL (mm)= 34.816
RUNOFF COEFFICIENT = 0.211

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0057)
ID= 1 DT=12.0 min

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.33	0.14
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	62.07	15.76
over (min)		12.00	12.00
Storage Coeff. (min)	=	1.22 (ii)	10.97 (ii)
Unit Hyd. Tpeak (min)	=	12.00	12.00
Unit Hyd. peak (cms)	=	0.14	0.09

		TOTALS
PEAK FLOW	(cms)=	0.06 0.00 0.061 (iii)
TIME TO PEAK	(hrs)=	1.40 1.40 1.40
RUNOFF VOLUME	(mm)=	33.82 9.06 26.38
TOTAL RAINFALL	(mm)=	34.82 34.82 34.82
RUNOFF COEFFICIENT	=	0.97 0.26 0.76

***** 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 (0073)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.061	1.40	26.38
+ ID2= 2 (0058):	2.51	0.044	1.60	7.34
ID = 3 (0073):	2.98	0.096	1.40	10.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066)
Inlet Cap.=0.181
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.10	1.40	10.34
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.98	0.10	1.40	10.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0053)
ID= 1 DT=12.0 min

Area (ha)= 5.86
Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.28	2.58
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	62.07	15.76
over (min)		12.00	12.00
Storage Coeff. (min)	=	1.22 (ii)	10.97 (ii)
Unit Hyd. Tpeak (min)	=	12.00	12.00
Unit Hyd. peak (cms)	=	0.14	0.09

		TOTALS
PEAK FLOW	(cms)=	0.57 0.08 0.646 (iii)
TIME TO PEAK	(hrs)=	1.40 1.40 1.40
RUNOFF VOLUME	(mm)=	33.82 9.06 22.92
TOTAL RAINFALL	(mm)=	34.82 34.82 34.82
RUNOFF COEFFICIENT	=	0.97 0.26 0.66

***** 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 (0055)
ID= 1 DT=12.0 min

Area (ha)= 2.71
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	62.07	15.76
over (min)		12.00	12.00
Storage Coeff. (min)	=	1.22 (ii)	10.97 (ii)

```
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.06          0.180 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      33.82         9.06          15.24
     TOTAL RAINFALL   (mm)=      34.82        34.82          34.82
     RUNOFF COEFFICIENT   =       0.97         0.26           0.44

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0065) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =       0.013        0.250

     Max.Eff.Inten.(mm/hr)=      62.07        15.76
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.22 (ii)   10.97 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.06          0.180 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      33.82         9.06          15.24
     TOTAL RAINFALL   (mm)=      34.82        34.82          34.82
     RUNOFF COEFFICIENT   =       0.97         0.26           0.44

***** 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   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0053):      5.86    0.646     1.40    22.92
       + ID2= 2 (0054):      1.34    0.025     1.60     7.20
         ==============================================
         ID = 3 (0051):      7.20    0.670     1.40    19.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0051):      7.20    0.670     1.40    19.99
       + ID2= 2 (0055):      2.71    0.180     1.40    15.24
         ==============================================
         ID = 1 (0051):      9.91    0.850     1.40    18.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0051):      9.91    0.850     1.40    18.70
       + ID2= 2 (0056):      0.10    0.000     1.40     0.64
         ==============================================
         ID = 3 (0051):     10.01    0.850     1.40    18.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0051):     10.01    0.850     1.40    18.52
       + ID2= 2 (0065):      2.71    0.180     1.40    15.24
         ==============================================
         ID = 1 (0051):     12.72    1.030     1.40    17.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0051):     12.72    1.030     1.40    17.82
       + ID2= 2 (0066):      2.98    0.096     1.40    10.34
         ==============================================
         ID = 3 (0051):     15.70    1.126     1.40    16.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
         ID1= 3 (0051):     15.70    1.126     1.40    16.40
       + ID2= 2 (0069):      0.00    0.000     0.00     0.00
         ==============================================
         ID = 1 (0051):     15.70    1.126     1.40    16.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0060) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0050):     20.92    0.643     1.70    19.90
       + ID2= 2 (0051):     15.70    1.126     1.40    16.40
         ==============================================
         ID = 3 (0060):     36.62    1.542     1.40    18.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0061) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |  0.5100      0.3577
                         0.2970     0.1233    |  0.6800      0.7154
                         0.4250     0.2220    |  0.7930      1.1964

                                  AREA     QPEAK     TPEAK      R.V.
                                  (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0060)      36.620     1.542      1.40      18.40
     OUTFLOW: ID= 1 (0061)      36.620     0.465      2.70      18.40

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 30.18
                TIME SHIFT OF PEAK FLOW          (min)= 78.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.2869

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  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

--------------------
| CHICAGO STORM    |     IDF curve parameters: A= 930.000
| Ptotal= 46.27 mm |                           B=   4.000
--------------------                           C=   0.798
```

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 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
0.17	2.85	1.17	22.78	2.17	6.72	3.17	3.39
0.33	3.26	1.33	113.21	2.33	5.72	3.33	3.14
0.50	3.84	1.50	30.05	2.50	4.99	3.50	2.94
0.67	4.72	1.67	15.54	2.67	4.45	3.67	2.76
0.83	6.21	1.83	10.66	2.83	4.02	3.83	2.61
1.00	9.42	2.00	8.20	3.00	3.67	4.00	2.47

CALIB
NASHYD (0011)
ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	2.92	1.200	37.85	2.200	6.55	3.20	3.35
0.400	3.45	1.400	85.49	2.400	5.48	3.40	3.08
0.600	4.28	1.600	22.80	2.600	4.72	3.60	2.85
0.800	5.71	1.800	12.29	2.800	4.16	3.80	2.66
1.000	8.88	2.000	8.61	3.000	3.73	4.00	2.49

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.039 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 11.943
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.258

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0010)
ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.36	1.51
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	85.49	27.73
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

		TOTALS
PEAK FLOW	(cms)=	0.651 (iii)
TIME TO PEAK	(hrs)=	1.40
RUNOFF VOLUME	(mm)=	33.44
TOTAL RAINFALL	(mm)=	46.27
RUNOFF COEFFICIENT	=	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.

CALIB
STANDHYD (0012)
ID= 1 DT=12.0 min

Area (ha)= 6.86
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	4.18	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	213.85	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	85.49	27.73
over	(min)	12.00	12.00
Storage Coeff.	(min)=	3.49 (ii)	11.26 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.09

		TOTALS
PEAK FLOW	(cms)=	1.120 (iii)
TIME TO PEAK	(hrs)=	1.40
RUNOFF VOLUME	(mm)=	33.44
TOTAL RAINFALL	(mm)=	46.27
RUNOFF COEFFICIENT	=	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.

CALIB
STANDHYD (0064)
ID= 1 DT=12.0 min

Area (ha)= 2.95
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.74	2.21
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	85.49	27.73
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

		TOTALS
PEAK FLOW	(cms)=	0.308 (iii)
TIME TO PEAK	(hrs)=	1.40
RUNOFF VOLUME	(mm)=	22.53
TOTAL RAINFALL	(mm)=	46.27
RUNOFF COEFFICIENT	=	0.49

***** 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 (0013)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):		3.87	0.651	1.40	33.44
+ ID2= 2 (0011):		0.91	0.039	1.40	11.94
ID = 3 (0013):		4.78	0.690	1.40	29.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):		4.78	0.690	1.40	29.35
+ ID2= 2 (0012):		6.86	1.120	1.40	33.44
ID = 1 (0013):		11.64	1.811	1.40	31.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0013) |
|   1 +  2 =  3    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	1.811	1.40	31.76
+ ID2= 2 (0064):	2.95	0.308	1.40	22.53
ID = 3 (0013):	14.59	2.119	1.40	29.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| RESERVOIR (0021) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |
-------------------
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	2.119	1.40	29.90
OUTFLOW: ID= 1 (0021)	14.590	0.403	1.80	29.88

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.04
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.2451

```
-------------------
| ROUTE PIPE (0031)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |
-------------------
```

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<--pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.40	1.80	29.88	0.28	1.66
OUTFLOW: ID= 1 (0031)	14.59	0.40	1.90	29.88	0.28	1.66

```
-------------------
| CALIB            |
| NASHYD    (0016) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.260 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 12.283
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.265

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0018) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	85.49	27.73
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

		TOTALS
PEAK FLOW	(cms)=	0.168 (iii)
TIME TO PEAK	(hrs)=	1.40
RUNOFF VOLUME	(mm)=	34.35
TOTAL RAINFALL	(mm)=	46.27
RUNOFF COEFFICIENT	=	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.

```
-------------------
| CALIB            |
| STANDHYD  (0017) |
|ID= 1 DT=12.0 min |
-------------------
```

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	85.49	27.73
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

		TOTALS
PEAK FLOW	(cms)=	0.369 (iii)
TIME TO PEAK	(hrs)=	1.40
RUNOFF VOLUME	(mm)=	31.62
TOTAL RAINFALL	(mm)=	46.27
RUNOFF COEFFICIENT	=	0.68

***** 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   (0019) |
|   1 +  2 =  3    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.260	1.40	12.28
+ ID2= 2 (0017):	2.34	0.369	1.40	31.62
ID = 3 (0019):	8.87	0.629	1.40	17.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD   (0019) |
|   3 +  2 =  1    |
-------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	0.629	1.40	17.39
+ ID2= 2 (0018):	0.97	0.168	1.40	34.35

```
          ID = 1 (0019):     9.84   0.798     1.40    19.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0032) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0019):     9.84   0.798     1.40    19.06
        + ID2= 2 (0031):    14.59   0.403     1.90    29.88
          ================================================
          ID = 3 (0032):    24.43   0.923     1.40    25.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0022) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                          0.0000     0.0000    |   0.6510     0.4564
                          0.1220     0.0863    |   0.8770     0.7894
                          0.3620     0.1603    |   0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0032)    24.430     0.923     1.40      25.52
     OUTFLOW: ID= 1 (0022)    24.430     0.387     2.80      25.51

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 41.96
                TIME SHIFT OF PEAK FLOW          (min)= 84.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.1863

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD    (0023) |   Area     (ha)=  10.18   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   0.339 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  12.827
     TOTAL RAINFALL   (mm)=  46.267
     RUNOFF COEFFICIENT   =   0.277

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0025) |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.090 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  12.586
     TOTAL RAINFALL   (mm)=  46.267
     RUNOFF COEFFICIENT   =   0.272

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0027) |   Area     (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.073 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  10.559
     TOTAL RAINFALL   (mm)=  46.267
     RUNOFF COEFFICIENT   =   0.228

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0024) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=          4.76          1.95
     Dep. Storage     (mm)=          1.00          1.50
     Average Slope     (%)=          2.00          2.00
     Length            (m)=         30.00         20.00
     Mannings n           =         0.013         0.250

     Max.Eff.Inten.(mm/hr)=         85.49         27.73
               over (min)           12.00         12.00
     Storage Coeff.  (min)=          1.07 (ii)     8.85 (ii)
     Unit Hyd. Tpeak (min)=         12.00         12.00
     Unit Hyd. peak  (cms)=          0.14          0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=          1.13          0.12      1.248 (iii)
     TIME TO PEAK    (hrs)=          1.40          1.40       1.40
     RUNOFF VOLUME    (mm)=         45.27         14.95      36.48
     TOTAL RAINFALL   (mm)=         46.27         46.27      46.27
     RUNOFF COEFFICIENT   =          0.98          0.32       0.79

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0062) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=          0.24          0.61
     Dep. Storage     (mm)=          1.00          1.50
     Average Slope     (%)=          2.00          2.00
     Length            (m)=         30.00         20.00
     Mannings n           =         0.013         0.250

     Max.Eff.Inten.(mm/hr)=         85.49         27.73
               over (min)           12.00         12.00
     Storage Coeff.  (min)=          1.07 (ii)     8.85 (ii)
     Unit Hyd. Tpeak (min)=         12.00         12.00
     Unit Hyd. peak  (cms)=          0.14          0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=          0.06          0.04      0.093 (iii)
     TIME TO PEAK    (hrs)=          1.40          1.40       1.40
     RUNOFF VOLUME    (mm)=         45.27         14.95      23.44
     TOTAL RAINFALL   (mm)=         46.27         46.27      46.27
     RUNOFF COEFFICIENT   =          0.98          0.32       0.51

***** 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.

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--------------------
| ADD HYD   (0028) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0023):    10.18   0.339     1.60    12.83
        + ID2= 2 (0024):     6.71   1.248     1.40    36.48
          ================================================
          ID = 3 (0028):    16.89   1.526     1.40    22.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0028) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
```

ID1= 3 (0028):	16.89	1.526	1.40	22.22
+ ID2= 2 (0025):	2.59	0.090	1.40	12.59
ID = 1 (0028):	19.48	1.616	1.40	20.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	1.616	1.40	20.94
+ ID2= 2 (0027):	1.61	0.073	1.40	10.56
ID = 3 (0028):	21.09	1.689	1.40	20.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	1.689	1.40	20.15
+ ID2= 2 (0062):	0.85	0.093	1.40	23.44
ID = 1 (0028):	21.94	1.783	1.40	20.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.387	2.80	25.51
+ ID2= 2 (0028):	21.94	1.783	1.40	20.28
ID = 3 (0029):	46.37	1.863	1.40	23.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030) IN= 2---> OUT= 1 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	1.863	1.40	23.04
OUTFLOW: ID= 1 (0030)	46.370	0.422	4.00	23.03

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.67
TIME SHIFT OF PEAK FLOW (min)=156.00
MAXIMUM STORAGE USED (ha.m.)= 0.4283

CALIB NASHYD (0005) ID= 1 DT= 5.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	2.85	1.083	22.78	2.083	6.72	3.08	3.39
0.167	2.85	1.167	22.78	2.167	6.72	3.17	3.39
0.250	3.26	1.250	113.21	2.250	5.72	3.25	3.14
0.333	3.26	1.333	113.21	2.333	5.72	3.33	3.14
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.583	4.72	1.583	15.54	2.583	4.45	3.58	2.76
0.667	4.72	1.667	15.54	2.667	4.45	3.67	2.76
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.61
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.61
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.068 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 12.919
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.279

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0004) ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.93	0.52
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	2.92	1.200	37.85	2.200	6.55	3.20	3.35
0.400	3.45	1.400	85.49	2.400	5.48	3.40	3.08
0.600	4.28	1.600	22.80	2.600	4.72	3.60	2.85
0.800	5.71	1.800	12.29	2.800	4.16	3.80	2.66
1.000	8.88	2.000	8.61	3.000	3.73	4.00	2.49

			TOTALS
Max.Eff.Inten.(mm/hr)=	85.49	27.73	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
PEAK FLOW (cms)=	0.22	0.03	0.252 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	45.27	14.95	34.35
TOTAL RAINFALL (mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT =	0.98	0.32	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.

CALIB STANDHYD (0063) ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.01	2.61
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

			TOTALS
Max.Eff.Inten.(mm/hr)=	85.49	27.73	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
PEAK FLOW (cms)=	0.24	0.16	0.398 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	45.27	14.95	23.44
TOTAL RAINFALL (mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT =	0.98	0.32	0.51

***** 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 (0007)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0004):	1.45	0.252	1.40	34.35
	+ ID2= 2 (0005):	1.33	0.068	1.42	12.92
	ID = 3 (0007):	2.78	0.306	1.42	24.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0007):	2.78	0.306	1.42	24.09
	+ ID2= 2 (0063):	3.62	0.398	1.40	23.44
	ID = 1 (0007):	6.40	0.683	1.42	23.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.683	1.42	23.72
OUTFLOW: ID= 1 (0033)	6.400	0.047	2.92	23.63

```
                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.92
                TIME SHIFT OF PEAK FLOW          (min)= 90.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.1108
```

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

```
PIPE Number      =   1.00
Diameter    (mm)=1650.00
Length       (m)= 850.00
Slope      (m/m)=  0.005
Manning n        =  0.013
```

<-------------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.05	2.92	23.63	0.10	0.83
OUTFLOW: ID= 1 (0034)	6.40	0.05	3.25	23.63	0.10	0.83

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

```
Area     (ha)=   8.03   Curve Number   (CN)= 74.0
Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
U.H. Tp(hrs)=   0.22

Unit Hyd Qpeak  (cms)=   1.394

PEAK FLOW       (cms)=   0.280 (i)
TIME TO PEAK    (hrs)=   1.400
RUNOFF VOLUME    (mm)=  12.586
TOTAL RAINFALL   (mm)=  46.267
RUNOFF COEFFICIENT   =   0.272

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

```
Area     (ha)=  10.64   Curve Number   (CN)= 74.0
Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
U.H. Tp(hrs)=   0.24

Unit Hyd Qpeak  (cms)=   1.693

PEAK FLOW       (cms)=   0.366 (i)
TIME TO PEAK    (hrs)=   1.600
RUNOFF VOLUME    (mm)=  12.709
TOTAL RAINFALL   (mm)=  46.267
RUNOFF COEFFICIENT   =   0.275

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

```
Area     (ha)=   2.11   Curve Number   (CN)= 74.0
Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
U.H. Tp(hrs)=   0.26

Unit Hyd Qpeak  (cms)=   0.310

PEAK FLOW       (cms)=   0.071 (i)
TIME TO PEAK    (hrs)=   1.600
RUNOFF VOLUME    (mm)=  12.794
TOTAL RAINFALL   (mm)=  46.267
RUNOFF COEFFICIENT   =   0.277

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

```
Area     (ha)=  17.98
Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
```

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	10.97	7.01	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	85.49	27.73	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
			TOTALS
PEAK FLOW (cms)=	2.60	0.42	3.026 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	45.27	14.95	33.44
TOTAL RAINFALL (mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT =	0.98	0.32	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.
```

CALIB STANDHYD (0039) ID= 1 DT=12.0 min	Area (ha)= 1.21 Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)	=	1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)	=	12.00	12.00	
Unit Hyd. peak (cms)	=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.16	0.03	0.191 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	31.62
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.68

***** 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.

DUHYD (0074) Inlet Cap.=0.169 #of Inlets= 1 Total(cms)= 0.2	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.19	1.40	31.62
MAJOR SYS.(ID= 2):	0.05	0.02	1.40	31.62
MINOR SYS.(ID= 3):	1.16	0.17	1.40	31.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0047) ID= 1 DT=12.0 min	Area (ha)= 1.50 Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.96	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)	=	1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)	=	12.00	12.00	
Unit Hyd. peak (cms)	=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.23	0.03	0.260 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	34.35
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	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.

DUHYD (0072) Inlet Cap.=0.363 #of Inlets= 1 Total(cms)= 0.4	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.26	1.40	34.35
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.50	0.26	1.40	34.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0035):	8.03	0.280	1.40	12.59
+ ID2= 2 (0036):	17.98	3.026	1.40	33.44
ID = 3 (0040):	26.01	3.307	1.40	27.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	26.01	3.307	1.40	27.01
+ ID2= 2 (0037):	10.64	0.366	1.60	12.71
ID = 1 (0040):	36.65	3.644	1.40	22.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	36.65	3.644	1.40	22.85
+ ID2= 2 (0038):	2.11	0.071	1.60	12.79
ID = 3 (0040):	38.76	3.704	1.40	22.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

*** W A R N I N G : HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003

ID1= 3 (0040):	38.76	3.704	1.40	22.31
+ ID2= 2 (0072):	0.00	0.000	0.00	0.00
ID = 1 (0040):	38.76	3.704	1.40	22.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	38.76	3.704	1.40	22.31
+ ID2= 2 (0074):	0.05	0.022	1.40	31.62
ID = 3 (0040):	38.81	3.726	1.40	22.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0034):	6.40	0.047	3.25	23.63
+ ID2= 2 (0040):	38.81	3.726	1.40	22.32

```
     ID = 3 (0041):    45.21   3.563     1.42    22.51

 NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)    |    (cms)     (ha.m.)
                           0.0000     0.0000    |   3.1150      0.9004
                           1.2740     0.5550    |   3.6250      1.1600
                           2.2650     0.7154    |   3.9640      1.3570

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
 INFLOW : ID= 2 (0041)     45.210      3.563      1.42       22.51
 OUTFLOW: ID= 1 (0043)     45.210      0.946      1.83       22.50

              PEAK   FLOW   REDUCTION [Qout/Qin](%)= 26.55
              TIME SHIFT OF PEAK FLOW         (min)= 25.00
              MAXIMUM  STORAGE   USED        (ha.m.)=  0.4131

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.128 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=   8.232
     TOTAL RAINFALL   (mm)=  46.267
     RUNOFF COEFFICIENT   =   0.178

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.076 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  12.653
     TOTAL RAINFALL   (mm)=  46.267
     RUNOFF COEFFICIENT   =   0.273

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      6.71         3.45
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     85.49        27.73
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.59         0.21          1.800 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=     45.27        14.95          34.96
     TOTAL RAINFALL   (mm)=     46.27        46.27          46.27
     RUNOFF COEFFICIENT   =      0.98         0.32           0.76

***** 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  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.86         0.41
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     85.49        27.73
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.21         0.02          0.230 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=     45.27        14.95          35.56
     TOTAL RAINFALL   (mm)=     46.27        46.27          46.27
     RUNOFF COEFFICIENT   =      0.98         0.32           0.77

***** 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.

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--------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK    R.V.
--------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.27      0.23      1.40    35.56
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   1.27      0.23      1.40    35.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0070) |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.38         1.12
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     85.49        27.73
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.33         0.07          0.394 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=     45.27        14.95          31.62
     TOTAL RAINFALL   (mm)=     46.27        46.27          46.27
     RUNOFF COEFFICIENT   =      0.98         0.32           0.68

***** 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.

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DUHYD (0071)					
Inlet Cap.=0.550					
#of Inlets= 1					
Total(cms)= 0.6	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
TOTAL HYD.(ID= 1):	2.50	0.39	1.40	31.62	
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00	
MINOR SYS.(ID= 3):	2.50	0.39	1.40	31.62	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0044):	3.28	0.128	1.40	8.23	
+ ID2= 2 (0045):	10.16	1.800	1.40	34.96	
ID = 3 (0048):	13.44	1.929	1.40	28.44	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0048):	13.44	1.929	1.40	28.44	
+ ID2= 2 (0046):	2.21	0.076	1.60	12.65	
ID = 1 (0048):	15.65	2.002	1.40	26.21	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0048):	15.65	2.002	1.40	26.21	
+ ID2= 2 (0069):	1.27	0.230	1.40	35.56	
ID = 3 (0048):	16.92	2.232	1.40	26.91	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0048):	16.92	2.232	1.40	26.91	
+ ID2= 2 (0071):	2.50	0.394	1.40	31.62	
ID = 1 (0048):	19.42	2.626	1.40	27.52	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0048):	19.42	2.626	1.40	27.52	
+ ID2= 2 (0072):	1.50	0.260	1.40	34.35	
ID = 3 (0048):	20.92	2.886	1.40	28.01	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.9630	0.3823
	0.5430	0.1233	1.3030	0.6907
	0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.920	2.886	1.40	28.01
OUTFLOW: ID= 1 (0049)	20.920	0.798	1.70	28.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 27.66
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.2601

ROUTE PIPE (0050)		
IN= 2---> OUT= 1	PIPE Number	= 1.00
DT= 5.0 min	Diameter (mm)	=1650.00
	Length (m)	= 467.00
	Slope (m/m)	= 0.006
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.92	0.80	1.70	28.00	0.37	2.17
OUTFLOW: ID= 1 (0050)	20.92	0.80	1.70	28.00	0.37	2.17

CALIB				
NASHYD (0054)	Area (ha)=	1.34	Curve Number (CN)=	74.0
ID= 1 DT=12.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.22		

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.047 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 12.586
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.272

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0056)	Area (ha)=	0.10	Curve Number (CN)=	74.0
ID= 1 DT=12.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.05		

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 1.122
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.024

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
NASHYD (0058)	Area (ha)=	2.51	Curve Number (CN)=	74.0
ID= 1 DT=12.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00

```
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.083 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  12.827
     TOTAL RAINFALL   (mm)=  46.267
     RUNOFF COEFFICIENT   =   0.277

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0057) |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.33         0.14
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      85.49        27.73
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.01          0.087 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      45.27        14.95          36.17
     TOTAL RAINFALL   (mm)=      46.27        46.27          46.27
     RUNOFF COEFFICIENT   =       0.98         0.32           0.78

***** 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.

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--------------------
| ADD HYD   (0073) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0057):     0.47   0.087     1.40    36.17
       + ID2= 2 (0058):     2.51   0.083     1.60    12.83
         ==========================================================
         ID = 3 (0073):     2.98   0.155     1.40    16.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| DUHYD     (0066) |
| Inlet Cap.=0.181 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.98      0.15      1.40   16.51
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   2.98      0.15      1.40   16.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0053) |   Area     (ha)=   5.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.28         2.58
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      85.49        27.73
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.78         0.16          0.934 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      45.27        14.95          31.93
     TOTAL RAINFALL   (mm)=      46.27        46.27          46.27
     RUNOFF COEFFICIENT   =       0.98         0.32           0.69

***** 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  (0055) |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      85.49        27.73
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.12          0.283 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      45.27        14.95          22.53
     TOTAL RAINFALL   (mm)=      46.27        46.27          46.27
     RUNOFF COEFFICIENT   =       0.98         0.32           0.49

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0065) |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      85.49        27.73
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.12          0.283 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      45.27        14.95          22.53
     TOTAL RAINFALL   (mm)=      46.27        46.27          46.27
     RUNOFF COEFFICIENT   =       0.98         0.32           0.49

***** 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.

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ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0053):	5.86	0.934	1.40	31.93
	+ ID2= 2 (0054):	1.34	0.047	1.40	12.59
	ID = 3 (0051):	7.20	0.981	1.40	28.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0051):	7.20	0.981	1.40	28.33
	+ ID2= 2 (0055):	2.71	0.283	1.40	22.53
	ID = 1 (0051):	9.91	1.264	1.40	26.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0051):	9.91	1.264	1.40	26.74
	+ ID2= 2 (0056):	0.10	0.001	1.40	1.12
	ID = 3 (0051):	10.01	1.265	1.40	26.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0051):	10.01	1.265	1.40	26.49
	+ ID2= 2 (0065):	2.71	0.283	1.40	22.53
	ID = 1 (0051):	12.72	1.548	1.40	25.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0051):	12.72	1.548	1.40	25.64
	+ ID2= 2 (0066):	2.98	0.155	1.40	16.51
	ID = 3 (0051):	15.70	1.703	1.40	23.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003

	ID1= 3 (0051):	15.70	1.703	1.40	23.91
	+ ID2= 2 (0069):	0.00	0.000	0.00	0.00
	ID = 1 (0051):	15.70	1.703	1.40	23.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0050):	20.92	0.800	1.70	28.00
	+ ID2= 2 (0051):	15.70	1.703	1.40	23.91
	ID = 3 (0060):	36.62	2.251	1.40	26.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.5100	0.3577
0.2970	0.1233	0.6800	0.7154
0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.620	2.251	1.40	26.25
OUTFLOW: ID= 1 (0061)	36.620	0.554	3.00	26.25

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.61
TIME SHIFT OF PEAK FLOW (min)= 96.00
MAXIMUM STORAGE USED (ha.m.)= 0.4502

****
** SIMULATION NUMBER: 3 **
****

CHICAGO STORM
Ptotal= 54.13 mm

IDF curve parameters: A=1021.000
B= 3.000
C= 0.787
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 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
0.17	3.43	1.17	25.32	2.17	7.85	3.17	4.06
0.33	3.92	1.33	135.63	2.33	6.73	3.33	3.78
0.50	4.59	1.50	33.17	2.50	5.91	3.50	3.54
0.67	5.59	1.67	17.50	2.67	5.29	3.67	3.33
0.83	7.28	1.83	12.21	2.83	4.79	3.83	3.15
1.00	10.84	2.00	9.50	3.00	4.39	4.00	2.99

CALIB
NASHYD (0011)
ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	3.52	1.200	43.70	2.200	7.66	3.20	4.02
0.400	4.14	1.400	101.48	2.400	6.45	3.40	3.70
0.600	5.09	1.600	25.33	2.600	5.60	3.60	3.44
0.800	6.72	1.800	13.97	2.800	4.96	3.80	3.21
1.000	10.25	2.000	9.95	3.000	4.46	4.00	3.02

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.054 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 15.968
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.295

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0010)
ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.36	1.51	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		101.48	37.18	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.67	0.13	0.793 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	40.03
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	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.

CALIB STANDHYD (0012) ID= 1 DT=12.0 min | Area (ha)= 6.86 Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	213.85	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		101.48	37.18	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	3.26 (ii)	10.17 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.10	
				TOTALS
PEAK FLOW	(cms)=	1.16	0.20	1.366 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	40.03
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	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.

CALIB STANDHYD (0064) ID= 1 DT=12.0 min | Area (ha)= 2.95 Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.74	2.21	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		101.48	37.18	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.21	0.19	0.394 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	27.93
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	0.52

***** 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 (0013) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.793	1.40	40.03
+ ID2= 2 (0011):	0.91	0.054	1.40	15.97
ID = 3 (0013):	4.78	0.847	1.40	35.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	0.847	1.40	35.45
+ ID2= 2 (0012):	6.86	1.366	1.40	40.03
ID = 1 (0013):	11.64	2.213	1.40	38.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	2.213	1.40	38.15
+ ID2= 2 (0064):	2.95	0.394	1.40	27.93
ID = 3 (0013):	14.59	2.607	1.40	36.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021) IN= 2---> OUT= 1 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	2.607	1.40	36.08
OUTFLOW: ID= 1 (0021)	14.590	0.464	1.80	36.06

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.80
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.2970

ROUTE PIPE (0031) IN= 2---> OUT= 1 DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70

0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.46	1.80	36.06	0.30	1.72
OUTFLOW: ID= 1 (0031)	14.59	0.46	1.90	36.06	0.30	1.72

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.363 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 16.423
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.303

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.62	0.35
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	101.48	37.18
over (min)	12.00	12.00
Storage Coeff. (min)=	1.00 (ii)	7.92 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

	TOTALS
PEAK FLOW (cms)=	0.204 (iii)
TIME TO PEAK (hrs)=	1.40
RUNOFF VOLUME (mm)=	41.03
TOTAL RAINFALL (mm)=	54.13
RUNOFF COEFFICIENT =	0.76

***** 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 (0017)
ID= 1 DT=12.0 min

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.29	1.05
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	101.48	37.18
over (min)	12.00	12.00
Storage Coeff. (min)=	1.00 (ii)	7.92 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

	TOTALS
PEAK FLOW (cms)=	0.451 (iii)
TIME TO PEAK (hrs)=	1.40
RUNOFF VOLUME (mm)=	53.13
TOTAL RAINFALL (mm)=	54.13
RUNOFF COEFFICIENT =	0.98

***** 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 (0019)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.363	1.40	16.42
+ ID2= 2 (0017):	2.34	0.451	1.40	38.01
ID = 3 (0019):	8.87	0.815	1.40	22.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	0.815	1.40	22.12
+ ID2= 2 (0018):	0.97	0.204	1.40	41.03
ID = 1 (0019):	9.84	1.019	1.40	23.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	1.019	1.40	23.98
+ ID2= 2 (0031):	14.59	0.464	1.90	36.06
ID = 3 (0032):	24.43	1.189	1.40	31.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	1.189	1.40	31.20
OUTFLOW: ID= 1 (0022)	24.430	0.436	3.10	31.19

PEAK FLOW REDUCTION [Qout/Qin](%)= 36.69
TIME SHIFT OF PEAK FLOW (min)=102.00
MAXIMUM STORAGE USED (ha.m.)= 0.2365

CALIB
NASHYD (0023)
ID= 1 DT=12.0 min

Area (ha)= 10.18 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 1.440

PEAK FLOW (cms)= 0.458 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 17.151
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.317

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0025)	Area (ha)=	2.59	Curve Number (CN)=	74.0	
ID= 1 DT=12.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.22			

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.126 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 16.829
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.311

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0027)	Area (ha)=	1.61	Curve Number (CN)=	74.0	
ID= 1 DT=12.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.13			

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.102 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 14.119
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.261

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0024)	Area (ha)=	6.71			
ID= 1 DT=12.0 min	Total Imp(%)=	71.00	Dir. Conn.(%)=	71.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.76	1.95	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		101.48	37.18	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	1.34	0.16	1.507 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	43.39
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	0.80

***** 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 (0062)	Area (ha)=	0.85			
ID= 1 DT=12.0 min	Total Imp(%)=	28.00	Dir. Conn.(%)=	28.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		101.48	37.18
over (min)		12.00	12.00
Storage Coeff. (min)=		1.00 (ii)	7.92 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.11
			TOTALS
PEAK FLOW	(cms)=	0.07	0.05	0.119 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	28.93
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	0.53

***** 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 (0028)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0023):	10.18	0.458	1.60	17.15	
+ ID2= 2 (0024):	6.71	1.507	1.40	43.39	
ID = 3 (0028):	16.89	1.896	1.40	27.57	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0028):	16.89	1.896	1.40	27.57	
+ ID2= 2 (0025):	2.59	0.126	1.40	16.83	
ID = 1 (0028):	19.48	2.022	1.40	26.15	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0028):	19.48	2.022	1.40	26.15	
+ ID2= 2 (0027):	1.61	0.102	1.40	14.12	
ID = 3 (0028):	21.09	2.124	1.40	25.23	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0028):	21.09	2.124	1.40	25.23	
+ ID2= 2 (0062):	0.85	0.119	1.40	28.93	
ID = 1 (0028):	21.94	2.242	1.40	25.37	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0022):	24.43	0.436	3.10	31.19	
+ ID2= 2 (0028):	21.94	2.242	1.40	25.37	
ID = 3 (0029):	46.37	2.344	1.40	28.44	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE

(cms)	(ha.m.)	(cms)	(ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	2.344	1.40	28.44
OUTFLOW: ID= 1 (0030)	46.370	0.509	4.10	28.43

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.71
TIME SHIFT OF PEAK FLOW (min)=162.00
MAXIMUM STORAGE USED (ha.m.)= 0.5154

CALIB
NASHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.095 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 17.273
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.319

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.93	0.52
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	3.52	1.200	43.70	2.200	7.66	3.20	4.02
0.400	4.14	1.400	101.48	2.400	6.45	3.40	3.70
0.600	5.09	1.600	25.33	2.600	5.60	3.60	3.44
0.800	6.72	1.800	13.97	2.800	4.96	3.80	3.21
1.000	10.25	2.000	9.95	3.000	4.46	4.00	3.02

Max.Eff.Inten.(mm/hr)=	101.48	37.18	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
			TOTALS
PEAK FLOW (cms)=	0.26	0.04	0.306 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	53.13	19.53	41.03
TOTAL RAINFALL (mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT =	0.98	0.36	0.76

***** 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 (0063)
ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.01	2.61
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	101.48	37.18
over (min)	12.00	12.00
Storage Coeff. (min)=	1.00 (ii)	7.92 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11
		TOTALS
PEAK FLOW (cms)=	0.29	0.22 0.505 (iii)
TIME TO PEAK (hrs)=	1.40	1.40 1.40
RUNOFF VOLUME (mm)=	53.13	19.53 28.94
TOTAL RAINFALL (mm)=	54.13	54.13 54.13
RUNOFF COEFFICIENT =	0.98	0.36 0.53

***** 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 (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.306	1.40	41.03
+ ID2= 2 (0005):	1.33	0.095	1.42	17.27
ID = 3 (0007):	2.78	0.382	1.42	29.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.382	1.42	29.66
+ ID2= 2 (0063):	3.62	0.505	1.40	28.94
ID = 1 (0007):	6.40	0.861	1.42	29.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	6.400	0.861	1.42	29.25
OUTFLOW: ID= 1 (0033)	6.400	0.058	2.92	29.16

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.75
TIME SHIFT OF PEAK FLOW (min)= 90.00
MAXIMUM STORAGE USED (ha.m.)= 0.1362

```
| ROUTE PIPE (0034)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.00 min    |     Length       (m)= 850.00
--------------------     Slope      (m/m)=  0.005
                         Manning n        =  0.013
```

<-------------- TRAVEL TIME TABLE -------------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<---- hydrograph ----> <-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.06	2.92	29.16	0.10	0.86
OUTFLOW: ID= 1 (0034)	6.40	0.06	3.25	29.16	0.10	0.86

```
| CALIB              |
| NASHYD    (0035)   |   Area     (ha)=   8.03   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min   |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   1.394

     PEAK FLOW       (cms)=   0.392 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  16.829
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.311

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| CALIB              |
| NASHYD    (0037)   |   Area     (ha)=  10.64   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min   |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

     Unit Hyd Qpeak  (cms)=   1.693

     PEAK FLOW       (cms)=   0.493 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  16.993
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.314

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
| CALIB              |
| NASHYD    (0038)   |   Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min   |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.096 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  17.107
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.316
```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB              |
| STANDHYD  (0036)   |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min   |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	10.97	7.01	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	101.48	37.18	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	3.09	0.59	3.682 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	40.03
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	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.

```
| CALIB              |
| STANDHYD  (0039)   |   Area     (ha)=   1.21
|ID= 1 DT=12.0 min   |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	101.48	37.18	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.19	0.05	0.233 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	38.01
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	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.

```
| DUHYD     (0074)   |
| Inlet Cap.=0.169   |
| #of Inlets=    1   |
| Total(cms)=  0.2   |
--------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.23	1.40	38.01
MAJOR SYS.(ID= 2):	0.12	0.06	1.40	38.01
MINOR SYS.(ID= 3):	1.09	0.17	1.40	38.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| CALIB              |
```

```
| STANDHYD  (0047) |   Area     (ha)=   1.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.96         0.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     101.48        37.18
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       1.00 (ii)    7.92 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.05          0.316 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      53.13        19.53          41.03
     TOTAL RAINFALL   (mm)=      54.13        54.13          54.13
     RUNOFF COEFFICIENT   =       0.98         0.36           0.76

***** 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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0072) |
| Inlet Cap.=0.363 |
| #of Inlets=    1 |
| Total(cms)=  0.4 |
-------------------      AREA     QPEAK     TPEAK    R.V.
                          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.50      0.32      1.40   41.03
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   1.50      0.32      1.40   41.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0035):      8.03   0.392     1.40     16.83
        + ID2= 2 (0036):     17.98   3.682     1.40     40.03
          ================================================
          ID = 3 (0040):     26.01   4.074     1.40     32.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0040):     26.01   4.074     1.40     32.87
        + ID2= 2 (0037):     10.64   0.493     1.60     16.99
          ================================================
          ID = 1 (0040):     36.65   4.546     1.40     28.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0040):     36.65   4.546     1.40     28.26
        + ID2= 2 (0038):      2.11   0.096     1.60     17.11
          ================================================
          ID = 3 (0040):     38.76   4.630     1.40     27.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0040) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0072 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0040):     38.76   4.630     1.40     27.65
        + ID2= 2 (0072):      0.00   0.000     0.00      0.00
          ================================================
          ID = 1 (0040):     38.76   4.630     1.40     27.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0040) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0040):     38.76   4.630     1.40     27.65
        + ID2= 2 (0074):      0.12   0.064     1.40     38.01
          ================================================
          ID = 3 (0040):     38.88   4.695     1.40     27.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0041) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0034):      6.40   0.058     3.25     29.16
        + ID2= 2 (0040):     38.88   4.695     1.40     27.68
          ================================================
          ID = 3 (0041):     45.28   4.486     1.42     27.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000    |   3.1150     0.9004
                         1.2740     0.5550    |   3.6250     1.1600
                         2.2650     0.7154    |   3.9640     1.3570

                                  AREA     QPEAK     TPEAK       R.V.
                                   (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0041)      45.282     4.486      1.42       27.90
     OUTFLOW: ID= 1 (0043)      45.282     1.173      1.83       27.89

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 26.14
                    TIME SHIFT OF PEAK FLOW          (min)= 25.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.5119

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.178 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  11.006
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.203

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.23

     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.103 (i)
     TIME TO PEAK    (hrs)=   1.400
```

```
     RUNOFF VOLUME     (mm)=  16.918
     TOTAL RAINFALL    (mm)=  54.135
     RUNOFF COEFFICIENT    =   0.313

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0045)  |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min  |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      6.71         3.45
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=    101.48        37.18
               over (min)       12.00        12.00
     Storage Coeff.  (min)=     1.00 (ii)    7.92 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.89         0.29      2.181 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40       1.40
     RUNOFF VOLUME    (mm)=     53.13        19.53      41.71
     TOTAL RAINFALL   (mm)=     54.13        54.13      54.13
     RUNOFF COEFFICIENT   =      0.98         0.36       0.77

***** 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  (0059)  |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min  |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.86         0.41
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=    101.48        37.18
               over (min)       12.00        12.00
     Storage Coeff.  (min)=     1.00 (ii)    7.92 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.24         0.03      0.278 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40       1.40
     RUNOFF VOLUME    (mm)=     53.13        19.53      42.38
     TOTAL RAINFALL   (mm)=     54.13        54.13      54.13
     RUNOFF COEFFICIENT   =      0.98         0.36       0.78

***** 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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0069)  |
| Inlet Cap.=0.320  |
| #of Inlets=    1  |
| Total(cms)=  0.3  |       AREA     QPEAK     TPEAK     R.V.
-------------------       (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.27      0.28      1.40    42.38
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   1.27      0.28      1.40    42.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0070)  |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min  |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.38         1.12
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=    101.48        37.18
               over (min)       12.00        12.00
     Storage Coeff.  (min)=     1.00 (ii)    7.92 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.39         0.09      0.482 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40       1.40
     RUNOFF VOLUME    (mm)=     53.13        19.53      38.01
     TOTAL RAINFALL   (mm)=     54.13        54.13      54.13
     RUNOFF COEFFICIENT   =      0.98         0.36       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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0071)  |
| Inlet Cap.=0.550  |
| #of Inlets=    1  |
| Total(cms)=  0.6  |       AREA     QPEAK     TPEAK     R.V.
-------------------       (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.50      0.48      1.40    38.01
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   2.50      0.48      1.40    38.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28    0.178     1.40    11.01
        + ID2= 2 (0045):    10.16    2.181     1.40    41.71
          ================================================
          ID = 3 (0048):    13.44    2.359     1.40    34.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44    2.359     1.40    34.22
        + ID2= 2 (0046):     2.21    0.103     1.40    16.92
          ================================================
          ID = 1 (0048):    15.65    2.462     1.40    31.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65    2.462     1.40    31.77
        + ID2= 2 (0069):     1.27    0.278     1.40    42.38
          ================================================
          ID = 3 (0048):    16.92    2.739     1.40    32.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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-------------------------------------------------------------------------------

-------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.92    2.739     1.40    32.57
        + ID2= 2 (0071):     2.50    0.482     1.40    38.01
          ================================================
          ID = 1 (0048):    19.42    3.222     1.40    33.27

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------

-------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.42    3.222     1.40    33.27
        + ID2= 2 (0072):     1.50    0.316     1.40    41.03
          ================================================
          ID = 3 (0048):    20.92    3.538     1.40    33.83

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0049) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)     |    (cms)     (ha.m.)
                         0.0000     0.0000     |   0.9630     0.3823
                         0.5430     0.1233     |   1.3030     0.6907
                         0.7650     0.2343     |   1.5860     1.0977

                                AREA     QPEAK     TPEAK      R.V.
                                (ha)     (cms)     (hrs)      (mm)
    INFLOW : ID= 2 (0048)     20.920     3.538      1.40     33.83
    OUTFLOW: ID= 1 (0049)     20.920     0.882      1.70     33.82

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 24.94
                  TIME SHIFT OF PEAK FLOW         (min)= 18.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3221

-------------------------------------------------------------------------------

-------------------
| ROUTE PIPE (0050)|     PIPE Number     =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 467.00
-------------------     Slope      (m/m)=  0.006
                        Manning n        =  0.013

    <----------------- TRAVEL TIME TABLE ---------------------->
      DEPTH      VOLUME     FLOW RATE    VELOCITY     TRAV.TIME
        (m)     (cu.m.)       (cms)        (m/s)         min
       0.09    .201E+02          0.0         0.88          8.87
       0.17    .560E+02          0.2         1.37          5.68
       0.26    .101E+03          0.4         1.76          4.42
       0.35    .153E+03          0.7         2.09          3.72
       0.43    .210E+03          1.1         2.38          3.27
       0.52    .270E+03          1.5         2.64          2.95
       0.61    .334E+03          2.0         2.86          2.72
       0.69    .399E+03          2.6         3.06          2.55
       0.78    .466E+03          3.2         3.23          2.41
       0.87    .533E+03          3.9         3.38          2.31
       0.96    .599E+03          4.5         3.50          2.22
       1.04    .665E+03          5.1         3.60          2.16
       1.13    .728E+03          5.7         3.68          2.11
       1.22    .789E+03          6.3         3.74          2.08
       1.30    .846E+03          6.8         3.76          2.07
       1.39    .897E+03          7.2         3.76          2.07
       1.48    .943E+03          7.5         3.72          2.09
       1.56    .978E+03          7.6         3.63          2.15
       1.65    .999E+03          7.1         3.30          2.36
                                 <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)    (hrs)   (mm)       (m)      (m/s)
    INFLOW : ID= 2 (0049)    20.92     0.88     1.70   33.82       0.39      2.23
    OUTFLOW: ID= 1 (0050)    20.92     0.88     1.70   33.82       0.39      2.23

-------------------------------------------------------------------------------

-------------------
| CALIB            |
| NASHYD    (0054) |   Area     (ha)=   1.34   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.233

     PEAK FLOW       (cms)=   0.065 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  16.829
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.311

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0056) |   Area     (ha)=   0.10   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.05

     Unit Hyd Qpeak  (cms)=   0.076

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=   1.500
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.028

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

-------------------
| CALIB            |
| NASHYD    (0058) |   Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.113 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  17.151
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.317

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD  (0057) |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        0.33          0.14
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      101.48         37.18
               over (min)         12.00         12.00
     Storage Coeff.  (min)=        1.00 (ii)     7.92 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.11
                                                            *TOTALS*
     PEAK FLOW       (cms)=        0.09          0.01          0.105 (iii)
     TIME TO PEAK    (hrs)=        1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=       53.13         19.53          43.05
     TOTAL RAINFALL   (mm)=       54.13         54.13          54.13
     RUNOFF COEFFICIENT   =        0.98          0.36           0.80

***** 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.

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-------------------
| ADD HYD   (0073) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
```

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):		0.47	0.105	1.40	43.05
+ ID2= 2 (0058):		2.51	0.113	1.60	17.15
ID = 3 (0073):		2.98	0.201	1.40	21.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066)
Inlet Cap.=0.181
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.20	1.40	21.23
MAJOR SYS.(ID= 2):	0.07	0.02	1.40	21.23
MINOR SYS.(ID= 3):	2.91	0.18	1.40	21.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0053)
ID= 1 DT=12.0 min
Area (ha)= 5.86
Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.28	2.58	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		101.48	37.18	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.93	0.22	1.142 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	38.35
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	0.71

***** 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 (0055)
ID= 1 DT=12.0 min
Area (ha)= 2.71
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		101.48	37.18	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.19	0.17	0.362 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	27.93
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	0.52

***** 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 (0065)
ID= 1 DT=12.0 min
Area (ha)= 2.71
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		101.48	37.18	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.00 (ii)	7.92 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.19	0.17	0.362 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	53.13	19.53	27.93
TOTAL RAINFALL	(mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT	=	0.98	0.36	0.52

***** 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 (0051)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0053):		5.86	1.142	1.40	38.35
+ ID2= 2 (0054):		1.34	0.065	1.40	16.83
ID = 3 (0051):		7.20	1.208	1.40	34.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):		7.20	1.208	1.40	34.34
+ ID2= 2 (0055):		2.71	0.362	1.40	27.93
ID = 1 (0051):		9.91	1.570	1.40	32.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0051):		9.91	1.570	1.40	32.59
+ ID2= 2 (0056):		0.10	0.001	1.40	1.50
ID = 3 (0051):		10.01	1.570	1.40	32.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):		10.01	1.570	1.40	32.28
+ ID2= 2 (0065):		2.71	0.362	1.40	27.93
ID = 1 (0051):		12.72	1.933	1.40	31.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0051):    12.72    1.933     1.40    31.35
       + ID2= 2 (0066):     2.91    0.181     1.40    21.23
         ================================================
         ID = 3 (0051):    15.63    2.114     1.40    29.47
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0069 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
         ID1= 3 (0051):    15.63    2.114     1.40    29.47
       + ID2= 2 (0069):     0.00    0.000     0.00     0.00
         ================================================
         ID = 1 (0051):    15.63    2.114     1.40    29.47
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0060) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0050):    20.92    0.884     1.70    33.82
       + ID2= 2 (0051):    15.63    2.114     1.40    29.47
         ================================================
         ID = 3 (0060):    36.55    2.750     1.40    31.96
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| RESERVOIR (0061) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |  0.5100      0.3577
                          0.2970     0.1233   |  0.6800      0.7154
                          0.4250     0.2220   |  0.7930      1.1964

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0060)   36.554     2.750      1.40      31.96
     OUTFLOW: ID= 1 (0061)   36.554     0.610      3.30      31.96

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.17
                TIME SHIFT OF PEAK FLOW      (min)=114.00
                MAXIMUM  STORAGE  USED       (ha.m.)=  0.5678
```

```
  ****************************
  ** SIMULATION NUMBER:   4 **
  ****************************

| CHICAGO STORM    |      IDF curve parameters: A=1100.000
| Ptotal= 62.15 mm |                            B=   2.000
-------------------                            C=   0.776
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 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
0.17	4.06	1.17	27.34	2.17	9.00	3.17	4.78
0.33	4.62	1.33	159.94	2.33	7.77	3.33	4.46
0.50	5.38	1.50	35.45	2.50	6.86	3.50	4.19
0.67	6.51	1.67	19.27	2.67	6.16	3.67	3.95
0.83	8.38	1.83	13.70	2.83	5.61	3.83	3.74
1.00	12.24	2.00	10.80	3.00	5.16	4.00	3.55

```
| CALIB            |
| NASHYD    (0011) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17
```

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	4.16	1.200	49.44	2.200	8.80	3.20	4.73
0.400	4.87	1.400	118.44	2.400	7.47	3.40	4.37
0.600	5.94	1.600	27.36	2.600	6.51	3.60	4.07
0.800	7.75	1.800	15.56	2.800	5.80	3.80	3.81
1.000	11.60	2.000	11.29	3.000	5.23	4.00	3.59

```
     Unit Hyd Qpeak  (cms)=   0.204

     PEAK FLOW       (cms)=   0.072 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  20.423
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.329
```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB            |
| STANDHYD  (0010) |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.36          1.51
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=    118.44         48.02
               over (min)      12.00         12.00
     Storage Coeff.  (min)=     0.94 (ii)     7.19 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=     0.14          0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=     0.78          0.17        0.946 (iii)
     TIME TO PEAK    (hrs)=     1.40          1.40         1.40
     RUNOFF VOLUME    (mm)=    61.15         24.54        46.87
     TOTAL RAINFALL   (mm)=    62.15         62.15        62.15
     RUNOFF COEFFICIENT   =     0.98          0.39         0.75

***** 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  (0012) |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.18          2.68
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=    213.85         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=    118.44         48.02
               over (min)      12.00         12.00
     Storage Coeff.  (min)=     3.06 (ii)     9.30 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=     0.14          0.10
                                                        *TOTALS*
     PEAK FLOW       (cms)=     1.36          0.27        1.634 (iii)
     TIME TO PEAK    (hrs)=     1.40          1.40         1.40
     RUNOFF VOLUME    (mm)=    61.15         24.54        46.88
     TOTAL RAINFALL   (mm)=    62.15         62.15        62.15
     RUNOFF COEFFICIENT   =     0.98          0.39         0.75
```

***** 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 (0064) ID= 1 DT=12.0 min	Area (ha)= 2.95 Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.74	2.21
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	118.44	48.02
over (min)	12.00	12.00
Storage Coeff. (min)=	0.94 (ii)	7.19 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

		TOTALS
PEAK FLOW (cms)=	0.24	0.25	0.491 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	61.15	24.54	33.69
TOTAL RAINFALL (mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT =	0.98	0.39	0.54

***** 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 (0013) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	0.946	1.40	46.87
+ ID2= 2 (0011):	0.91	0.072	1.40	20.42
ID = 3 (0013):	4.78	1.019	1.40	41.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	1.019	1.40	41.84
+ ID2= 2 (0012):	6.86	1.634	1.40	46.88
ID = 1 (0013):	11.64	2.653	1.40	44.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	2.653	1.40	44.81
+ ID2= 2 (0064):	2.95	0.491	1.40	33.69
ID = 3 (0013):	14.59	3.144	1.40	42.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.6510	0.4563
	0.1220	0.1110	0.8770	0.7650
	0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	3.144	1.40	42.56
OUTFLOW: ID= 1 (0021)	14.590	0.527	1.80	42.54

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.77
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.3510

ROUTE PIPE (0031) IN= 2---> OUT= 1 DT= 5.0 min	PIPE Number = 1.00 Diameter (mm)=1650.00 Length (m)= 500.00 Slope (m/m)= 0.005 Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.53	1.80	42.54	0.32	1.79
OUTFLOW: ID= 1 (0031)	14.59	0.53	1.90	42.54	0.32	1.79

CALIB NASHYD (0016) ID= 1 DT=12.0 min	Area (ha)= 6.53 Curve Number (CN)= 74.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.482 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 21.004
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.338

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0018) ID= 1 DT=12.0 min	Area (ha)= 0.97 Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.62	0.35
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	118.44	48.02
over (min)	12.00	12.00
Storage Coeff. (min)=	0.94 (ii)	7.19 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

```
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.20          0.04          0.244 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=      61.15         24.54          47.97
     TOTAL RAINFALL   (mm)=      62.15         62.15          62.15
     RUNOFF COEFFICIENT   =       0.98          0.39           0.77

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0017) |   Area    (ha)=   2.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.29          1.05
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     118.44         48.02
               over (min)       12.00         12.00
     Storage Coeff.  (min)=       0.94 (ii)     7.19 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.42          0.12          0.542 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=      61.15         24.54          44.68
     TOTAL RAINFALL   (mm)=      62.15         62.15          62.15
     RUNOFF COEFFICIENT   =       0.98          0.39           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.

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--------------------
| ADD HYD   (0019) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0016):     6.53   0.482     1.40    21.00
        + ID2= 2 (0017):     2.34   0.542     1.40    44.68
          ================================================
          ID = 3 (0019):     8.87   1.024     1.40    27.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0019) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0019):     8.87   1.024     1.40    27.25
        + ID2= 2 (0018):     0.97   0.244     1.40    47.97
          ================================================
          ID = 1 (0019):     9.84   1.268     1.40    29.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0032) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0019):     9.84   1.268     1.40    29.29
        + ID2= 2 (0031):    14.59   0.527     1.90    42.54
          ================================================
          ID = 3 (0032):    24.43   1.496     1.40    37.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0022) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000     |  0.6510     0.4564
                         0.1220     0.0863     |  0.8770     0.7894
                         0.3620     0.1603     |  0.0000     0.0000

                                AREA     QPEAK     TPEAK      R.V.
                                 (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0032)     24.430     1.496      1.40      37.21
     OUTFLOW: ID= 1 (0022)     24.430     0.490      3.30      37.20

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 32.76
                TIME SHIFT OF PEAK FLOW         (min)=114.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.2916

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0023) |   Area    (ha)=  10.18   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   0.592 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  21.935
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.353

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0025) |   Area    (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.168 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  21.523
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.346

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0027) |   Area    (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.134 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  18.058
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.291

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0024) |   Area    (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.76          1.95
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     118.44         48.02
               over (min)       12.00         12.00
```

Storage Coeff.	(min)=	0.94 (ii)	7.19 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	1.57	0.22	1.786 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	61.15	24.54	50.54
TOTAL RAINFALL	(mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT	=	0.98	0.39	0.81

***** 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 (0062)
ID= 1 DT=12.0 min

Area (ha)= 0.85
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	118.44	48.02
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.94 (ii)	7.19 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11
			TOTALS
PEAK FLOW	(cms)=	0.08	0.07 0.147 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40 1.40
RUNOFF VOLUME	(mm)=	61.15	24.54 34.79
TOTAL RAINFALL	(mm)=	62.15	62.15 62.15
RUNOFF COEFFICIENT	=	0.98	0.39 0.56

***** 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 (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	10.18	0.592	1.60	21.94
+ ID2= 2 (0024):	6.71	1.786	1.40	50.54
ID = 3 (0028):	16.89	2.305	1.40	33.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	16.89	2.305	1.40	33.30
+ ID2= 2 (0025):	2.59	0.168	1.40	21.52
ID = 1 (0028):	19.48	2.473	1.40	31.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0028):	19.48	2.473	1.40	31.73
+ ID2= 2 (0027):	1.61	0.134	1.40	18.06
ID = 3 (0028):	21.09	2.608	1.40	30.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0028):	21.09	2.608	1.40	30.69
+ ID2= 2 (0062):	0.85	0.147	1.40	34.79
ID = 1 (0028):	21.94	2.755	1.40	30.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	24.43	0.490	3.30	37.20
+ ID2= 2 (0028):	21.94	2.755	1.40	30.85
ID = 3 (0029):	46.37	2.883	1.40	34.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	2.883	1.40	34.19
OUTFLOW: ID= 1 (0030)	46.370	0.598	4.10	34.19

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.75
TIME SHIFT OF PEAK FLOW (min)=162.00
MAXIMUM STORAGE USED (ha.m.)= 0.6055

CALIB
NASHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	4.06	1.083	27.34	2.083	9.00	3.08	4.78
0.167	4.06	1.167	27.34	2.167	9.00	3.17	4.78
0.250	4.62	1.250	159.94	2.250	7.77	3.25	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Unit Hyd Qpeak	(cms)=	0.391	
PEAK FLOW	(cms)=	0.125	(i)
TIME TO PEAK	(hrs)=	1.417	
RUNOFF VOLUME	(mm)=	22.092	
TOTAL RAINFALL	(mm)=	62.154	
RUNOFF COEFFICIENT	=	0.355	

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB
| STANDHYD  (0004) |   Area    (ha)=   1.45
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
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                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.93         0.52
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  12.0 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
    0.200    4.16 | 1.200   49.44 | 2.200    8.80 | 3.20    4.73
    0.400    4.87 | 1.400  118.44 | 2.400    7.47 | 3.40    4.37
    0.600    5.94 | 1.600   27.36 | 2.600    6.51 | 3.60    4.07
    0.800    7.75 | 1.800   15.56 | 2.800    5.80 | 3.80    3.81
    1.000   11.60 | 2.000   11.29 | 3.000    5.23 | 4.00    3.59

     Max.Eff.Inten.(mm/hr)=     118.44        48.02
           over (min)           12.00        12.00
     Storage Coeff.  (min)=      0.94 (ii)    7.19 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.31         0.06          0.364 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=     61.15        24.54          47.97
     TOTAL RAINFALL   (mm)=     62.15        62.15          62.15
     RUNOFF COEFFICIENT   =      0.98         0.39           0.77

***** 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.

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| CALIB
| STANDHYD  (0063) |   Area    (ha)=   3.62
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
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                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.01         2.61
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     118.44        48.02
           over (min)           12.00        12.00
     Storage Coeff.  (min)=      0.94 (ii)    7.19 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.33         0.29          0.627 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=     61.15        24.54          34.79
     TOTAL RAINFALL   (mm)=     62.15        62.15          62.15
     RUNOFF COEFFICIENT   =      0.98         0.39           0.56

***** 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.

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| ADD HYD   (0007) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0004):      1.45   0.364     1.40    47.97
       + ID2= 2 (0005):      1.33   0.125     1.42    22.09
         ================================================
         ID = 3 (0007):      2.78   0.467     1.42    35.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0007) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)      (mm)
         ID1= 3 (0007):      2.78   0.467     1.42    35.59
       + ID2= 2 (0063):      3.62   0.627     1.40    34.79
         ================================================
         ID = 1 (0007):      6.40   1.060     1.42    35.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
-------------------
| RESERVOIR (0033) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)     |    (cms)     (ha.m.)
                         0.0000     0.0000     |   0.3260      0.8017
                         0.0790     0.1850     |   0.3960      0.9004
                         0.2270     0.3947     |   0.0000      0.0000

                              AREA     QPEAK     TPEAK        R.V.
                               (ha)     (cms)     (hrs)        (mm)
     INFLOW : ID= 2 (0007)    6.400     1.060      1.42       35.15
     OUTFLOW: ID= 1 (0033)    6.400     0.070      3.00       35.06

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.58
                   TIME SHIFT OF PEAK FLOW          (min)= 95.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=  0.1632

-------------------------------------------------------------------------------
-------------------
| ROUTE PIPE (0034)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter     (mm)=1650.00
| DT=  5.0 min     |     Length        (m)= 850.00
-------------------      Slope       (m/m)=  0.005
                         Manning n         =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)     (cu.m.)       (cms)         (m/s)         min
        0.09    .367E+02        0.0          0.80         17.68
        0.17    .102E+03        0.1          1.25         11.33
        0.26    .184E+03        0.3          1.61          8.81
        0.35    .278E+03        0.6          1.91          7.41
        0.43    .382E+03        1.0          2.18          6.51
        0.52    .492E+03        1.4          2.41          5.88
        0.61    .608E+03        1.9          2.61          5.43
        0.69    .727E+03        2.4          2.79          5.08
        0.78    .848E+03        2.9          2.95          4.81
        0.87    .970E+03        3.5          3.08          4.60
        0.96    .109E+04        4.1          3.20          4.43
        1.04    .121E+04        4.7          3.29          4.31
        1.13    .133E+04        5.2          3.36          4.22
        1.22    .144E+04        5.8          3.41          4.15
        1.30    .154E+04        6.2          3.44          4.12
        1.39    .163E+04        6.6          3.43          4.13
        1.48    .172E+04        6.9          3.40          4.17
        1.56    .178E+04        6.9          3.31          4.28
        1.65    .182E+04        6.5          3.02          4.70
                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)    (hrs)   (mm)       (m)       (m/s)
     INFLOW : ID= 2 (0033)     6.40     0.07     3.00  35.06       0.11       0.90
     OUTFLOW: ID= 1 (0034)     6.40     0.07     3.25  35.05       0.11       0.90

-------------------------------------------------------------------------------
-------------------
| CALIB
| NASHYD    (0035) |   Area     (ha)=   8.03   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   1.394

     PEAK FLOW       (cms)=   0.521 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  21.524
     TOTAL RAINFALL   (mm)=  62.155
```

```
     RUNOFF COEFFICIENT   =   0.346

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0037)  |   Area     (ha)=  10.64   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.24

     Unit Hyd Qpeak  (cms)=   1.693

     PEAK FLOW       (cms)=   0.633 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  21.734
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.350

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0038)  |   Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.124 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  21.879
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.352

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0036)  |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min  |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.97          7.01
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     118.44         48.02
               over (min)       12.00         12.00
     Storage Coeff.  (min)=       0.94 (ii)     7.19 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       3.61          0.79          4.397 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=      61.15         24.54          46.88
     TOTAL RAINFALL   (mm)=      62.15         62.15          62.15
     RUNOFF COEFFICIENT   =       0.98          0.39           0.75

***** 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  (0039)  |   Area     (ha)=   1.21
|ID= 1 DT=12.0 min  |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.67          0.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     118.44         48.02
               over (min)       12.00         12.00
     Storage Coeff.  (min)=       0.94 (ii)     7.19 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.22          0.06          0.280 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=      61.15         24.54          44.68
     TOTAL RAINFALL   (mm)=      62.15         62.15          62.15
     RUNOFF COEFFICIENT   =       0.98          0.39           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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0074)  |
| Inlet Cap.=0.169  |
| #of Inlets=    1  |
| Total(cms)=  0.2  |       AREA     QPEAK     TPEAK    R.V.
-------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.21      0.28      1.40    44.68
     ==========================================================
     MAJOR SYS.(ID= 2):   0.18      0.11      1.40    44.68
     MINOR SYS.(ID= 3):   1.03      0.17      1.40    44.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0047)  |   Area     (ha)=   1.50
|ID= 1 DT=12.0 min  |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.96          0.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     118.44         48.02
               over (min)       12.00         12.00
     Storage Coeff.  (min)=       0.94 (ii)     7.19 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.32          0.06          0.377 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=      61.15         24.54          47.97
     TOTAL RAINFALL   (mm)=      62.15         62.15          62.15
     RUNOFF COEFFICIENT   =       0.98          0.39           0.77

***** 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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0072)  |
| Inlet Cap.=0.363  |
| #of Inlets=    1  |
| Total(cms)=  0.4  |       AREA     QPEAK     TPEAK    R.V.
-------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.50      0.38      1.40    47.97
     ==========================================================
     MAJOR SYS.(ID= 2):   0.02      0.01      1.40    47.97
     MINOR SYS.(ID= 3):   1.48      0.36      1.40    47.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)  |
|   1 +  2 =  3     |       AREA    QPEAK    TPEAK     R.V.
-------------------       (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0035):    8.03   0.521     1.40    21.52
```

```
          + ID2= 2 (0036):    17.98   4.397     1.40    46.88
            ==============================================
            ID = 3 (0040):    26.01   4.918     1.40    39.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0040)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0040):	26.01	4.918	1.40	39.05
	+ ID2= 2 (0037):	10.64	0.633	1.60	21.73
	ID = 1 (0040):	36.65	5.546	1.40	34.02

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0040)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0040):	36.65	5.546	1.40	34.02
	+ ID2= 2 (0038):	2.11	0.124	1.60	21.88
	ID = 3 (0040):	38.76	5.659	1.40	33.36

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0040)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0040):	38.76	5.659	1.40	33.36
	+ ID2= 2 (0072):	0.02	0.014	1.40	47.97
	ID = 1 (0040):	38.78	5.673	1.40	33.37

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0040)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0040):	38.78	5.673	1.40	33.37
	+ ID2= 2 (0074):	0.18	0.111	1.40	44.68
	ID = 3 (0040):	38.96	5.784	1.40	33.42

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0041)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0034):	6.40	0.070	3.25	35.05
	+ ID2= 2 (0040):	38.96	5.784	1.40	33.42
	ID = 3 (0041):	45.36	5.520	1.42	33.66

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

RESERVOIR (0043)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	3.1150	0.9004
		1.2740	0.5550	3.6250	1.1600
		2.2650	0.7154	3.9640	1.3570

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW :	ID= 2 (0041)	45.360	5.520	1.42	33.66
OUTFLOW:	ID= 1 (0043)	45.360	1.584	1.83	33.66

```
     PEAK   FLOW   REDUCTION [Qout/Qin](%)= 28.70
     TIME SHIFT OF PEAK FLOW          (min)= 25.00
     MAXIMUM  STORAGE   USED       (ha.m.)=  0.6067
```

CALIB NASHYD (0044) ID= 1 DT=12.0 min				
	Area	(ha)= 3.28	Curve Number	(CN)= 74.0
	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.10		

```
     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.235 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  14.077
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.226

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB NASHYD (0046) ID= 1 DT=12.0 min				
	Area	(ha)= 2.21	Curve Number	(CN)= 74.0
	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.23		

```
     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.137 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  21.638
     TOTAL RAINFALL   (mm)=  62.155
     RUNOFF COEFFICIENT   =   0.348

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB STANDHYD (0045) ID= 1 DT=12.0 min				
	Area	(ha)= 10.16		
	Total Imp	(%)= 66.00	Dir. Conn.	(%)= 66.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	6.71	3.45	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	118.44	48.02	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.94 (ii)	7.19 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	2.21	0.39	2.595 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	61.15	24.54	48.71
TOTAL RAINFALL	(mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT	=	0.98	0.39	0.78

```
***** 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 (0059) ID= 1 DT=12.0 min				
	Area	(ha)= 1.27		
	Total Imp	(%)= 68.00	Dir. Conn.	(%)= 68.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.86	0.41
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	118.44	48.02
over	(min)	12.00	12.00

```
     Storage Coeff.  (min)=       0.94 (ii)    7.19 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.28         0.05          0.330 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      61.15        24.54          49.43
     TOTAL RAINFALL   (mm)=      62.15        62.15          62.15
     RUNOFF COEFFICIENT   =       0.98         0.39           0.80

***** 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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK    R.V.
-------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.27      0.33      1.40   49.43
     ==========================================================
     MAJOR SYS.(ID= 2):   0.01      0.01      1.40   49.43
     MINOR SYS.(ID= 3):   1.26      0.32      1.40   49.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| STANDHYD  (0070)  |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min  |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.38         1.12
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     118.44        48.02
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.94 (ii)    7.19 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.45         0.13          0.579 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=      61.15        24.54          44.68
     TOTAL RAINFALL   (mm)=      62.15        62.15          62.15
     RUNOFF COEFFICIENT   =       0.98         0.39           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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0071) |
| Inlet Cap.=0.550 |
| #of Inlets=    1 |
| Total(cms)=  0.6 |       AREA     QPEAK     TPEAK    R.V.
-------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.50      0.58      1.40   44.68
     ==========================================================
     MAJOR SYS.(ID= 2):   0.05      0.03      1.40   44.68
     MINOR SYS.(ID= 3):   2.45      0.55      1.40   44.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)  |
|   1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28   0.235     1.40    14.08
        + ID2= 2 (0045):    10.16   2.595     1.40    48.71
          ==========================================================
          ID = 3 (0048):    13.44   2.830     1.40    40.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)  |
|   3 +  2 =  1     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44   2.830     1.40    40.26
        + ID2= 2 (0046):     2.21   0.137     1.40    21.64
          ==========================================================
          ID = 1 (0048):    15.65   2.967     1.40    37.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)  |
|   1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65   2.967     1.40    37.63
        + ID2= 2 (0069):     1.26   0.320     1.40    49.43
          ==========================================================
          ID = 3 (0048):    16.91   3.287     1.40    38.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)  |
|   3 +  2 =  1     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.91   3.287     1.40    38.50
        + ID2= 2 (0071):     2.45   0.550     1.40    44.68
          ==========================================================
          ID = 1 (0048):    19.36   3.837     1.40    39.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0048)  |
|   1 +  2 =  3     |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.36   3.837     1.40    39.29
        + ID2= 2 (0072):     1.48   0.363     1.40    47.97
          ==========================================================
          ID = 3 (0048):    20.84   4.200     1.40    39.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0049)  |
| IN= 2---> OUT= 1  |
| DT=  5.0 min      |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)     |   (cms)     (ha.m.)
                          0.0000     0.0000     |  0.9630     0.3823
                          0.5430     0.1233     |  1.3030     0.6907
                          0.7650     0.2343     |  1.5860     1.0977

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0048)     20.839     4.200      1.40      39.90
     OUTFLOW: ID= 1 (0049)     20.839     0.968      1.70      39.90

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.04
                TIME SHIFT OF PEAK FLOW          (min)= 18.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.3873

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-------------------
| ROUTE PIPE (0050) |     PIPE Number      =   1.00
| IN= 2---> OUT= 1  |     Diameter    (mm)=1650.00
| DT=  5.0 min      |     Length       (m)= 467.00
-------------------       Slope      (m/m)=  0.006
                          Manning n       =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
```

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.84	0.97	1.70	39.90	0.41	2.30
OUTFLOW: ID= 1 (0050)	20.84	0.97	1.70	39.90	0.41	2.30

CALIB NASHYD (0054) ID= 1 DT=12.0 min

Area (ha)= 1.34 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.087 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 21.523
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.346

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0056) ID= 1 DT=12.0 min

Area (ha)= 0.10 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.05

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 1.919
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.031

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0058) ID= 1 DT=12.0 min

Area (ha)= 2.51 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.355

PEAK FLOW (cms)= 0.146 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 21.935
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.353

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0057) ID= 1 DT=12.0 min

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.33	0.14
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	118.44	48.02
over (min)	12.00	12.00
Storage Coeff. (min)=	0.94 (ii)	7.19 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

		TOTALS
PEAK FLOW (cms)=	0.11	0.02	0.124 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	61.15	24.54	50.16
TOTAL RAINFALL (mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT =	0.98	0.39	0.81

***** 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 (0073)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0057):	0.47	0.124	1.40	50.16
+ ID2= 2 (0058):	2.51	0.146	1.60	21.94
ID = 3 (0073):	2.98	0.252	1.40	26.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066)
Inlet Cap.=0.181
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.25	1.40	26.39
MAJOR SYS.(ID= 2):	0.19	0.07	1.40	26.39
MINOR SYS.(ID= 3):	2.79	0.18	1.40	26.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0053) ID= 1 DT=12.0 min

Area (ha)= 5.86
Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	2.58
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	118.44	48.02
over (min)	12.00	12.00
Storage Coeff. (min)=	0.94 (ii)	7.19 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.11

		TOTALS
PEAK FLOW (cms)=	1.08	0.29	1.370 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	61.15	24.54	45.05
TOTAL RAINFALL (mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT =	0.98	0.39	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.

CALIB					
STANDHYD (0055)	Area (ha)= 2.71				
ID= 1 DT=12.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 25.00			

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		118.44	48.02	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.94 (ii)	7.19 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
			TOTALS	
PEAK FLOW	(cms)=	0.22	0.23	0.451 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	61.15	24.54	33.69
TOTAL RAINFALL	(mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT	=	0.98	0.39	0.54

***** 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 (0065)	Area (ha)= 2.71				
ID= 1 DT=12.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 25.00			

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		118.44	48.02	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.94 (ii)	7.19 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
			TOTALS	
PEAK FLOW	(cms)=	0.22	0.23	0.451 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	61.15	24.54	33.69
TOTAL RAINFALL	(mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT	=	0.98	0.39	0.54

***** 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 (0051)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0053):	5.86	1.370	1.40	45.05
+ ID2= 2 (0054):	1.34	0.087	1.40	21.52
ID = 3 (0051):	7.20	1.457	1.40	40.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):	7.20	1.457	1.40	40.67
+ ID2= 2 (0055):	2.71	0.451	1.40	33.69
ID = 1 (0051):	9.91	1.908	1.40	38.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0051):	9.91	1.908	1.40	38.76
+ ID2= 2 (0056):	0.10	0.001	1.40	1.92
ID = 3 (0051):	10.01	1.909	1.40	38.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):	10.01	1.909	1.40	38.39
+ ID2= 2 (0065):	2.71	0.451	1.40	33.69
ID = 1 (0051):	12.72	2.360	1.40	37.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0051):	12.72	2.360	1.40	37.39
+ ID2= 2 (0066):	2.79	0.181	1.40	26.39
ID = 3 (0051):	15.51	2.541	1.40	35.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0051):	15.51	2.541	1.40	35.41
+ ID2= 2 (0069):	0.01	0.010	1.40	49.43
ID = 1 (0051):	15.52	2.551	1.40	35.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0050):	20.84	0.970	1.70	39.90
+ ID2= 2 (0051):	15.52	2.551	1.40	35.43
ID = 3 (0060):	36.36	3.245	1.40	37.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.5100	0.3577
	0.2970	0.1233	0.6800	0.7154
	0.4250	0.2220	0.7930	1.1964

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0060)	36.359	3.245	1.40	37.99
OUTFLOW: ID= 1 (0061)	36.359	0.667	3.50	37.99

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                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.56
                TIME SHIFT OF PEAK FLOW          (min)=126.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.6886

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  ****************************
  ** SIMULATION NUMBER:   5 **
  ****************************

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| CHICAGO STORM    |    IDF curve parameters: A=1488.000
| Ptotal= 72.26 mm |                          B=   3.000
--------------------                          C=   0.803
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 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
  0.17    4.27  |  1.17   33.54  |   2.17    9.99  |  3.17    5.08
  0.33    4.89  |  1.33  189.72  |   2.33    8.52  |  3.33    4.72
  0.50    5.75  |  1.50   44.29  |   2.50    7.46  |  3.50    4.41
  0.67    7.05  |  1.67   22.84  |   2.67    6.65  |  3.67    4.15
  0.83    9.24  |  1.83   15.74  |   2.83    6.02  |  3.83    3.91
  1.00   13.94  |  2.00   12.16  |   3.00    5.50  |  4.00    3.71

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--------------------
| CALIB            |
| NASHYD    (0011) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

        NOTE:  RAINFALL WAS TRANSFORMED TO  12.0 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
 0.200    4.38  | 1.200   59.57  | 2.200    9.74  |  3.20    5.02
 0.400    5.18  | 1.400  141.24  | 2.400    8.17  |  3.40    4.62
 0.600    6.40  | 1.600   33.57  | 2.600    7.05  |  3.60    4.28
 0.800    8.51  | 1.800   18.11  | 2.800    6.23  |  3.80    3.99
 1.000   13.16  | 2.000   12.76  | 3.000    5.59  |  4.00    3.74

    Unit Hyd Qpeak  (cms)=   0.204

    PEAK FLOW       (cms)=   0.098 (i)
    TIME TO PEAK    (hrs)=   1.400
    RUNOFF VOLUME    (mm)=  26.456
    TOTAL RAINFALL   (mm)=  72.259
    RUNOFF COEFFICIENT   =   0.366

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0010) |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       2.36         1.51
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     141.24        63.75
              over (min)        12.00        12.00
    Storage Coeff.  (min)=       0.88 (ii)    6.45 (ii)
    Unit Hyd. Tpeak (min)=      12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
    PEAK FLOW       (cms)=       0.93         0.23        1.159 (iii)
    TIME TO PEAK    (hrs)=       1.40         1.40         1.40
    RUNOFF VOLUME    (mm)=      71.26        31.29        55.67
    TOTAL RAINFALL   (mm)=      72.26        72.26        72.26
    RUNOFF COEFFICIENT   =       0.99         0.43         0.77

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0012) |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       4.18         2.68
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=     213.85        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     141.24        63.75
              over (min)        12.00        12.00
    Storage Coeff.  (min)=       2.85 (ii)    8.43 (ii)
    Unit Hyd. Tpeak (min)=      12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
    PEAK FLOW       (cms)=       1.63         0.38        2.005 (iii)
    TIME TO PEAK    (hrs)=       1.40         1.40         1.40
    RUNOFF VOLUME    (mm)=      71.26        31.29        55.67
    TOTAL RAINFALL   (mm)=      72.26        72.26        72.26
    RUNOFF COEFFICIENT   =       0.99         0.43         0.77

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0064) |   Area     (ha)=   2.95
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       0.74         2.21
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     141.24        63.75
              over (min)        12.00        12.00
    Storage Coeff.  (min)=       0.88 (ii)    6.45 (ii)
    Unit Hyd. Tpeak (min)=      12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
    PEAK FLOW       (cms)=       0.29         0.34        0.631 (iii)
    TIME TO PEAK    (hrs)=       1.40         1.40         1.40
    RUNOFF VOLUME    (mm)=      71.26        31.29        41.28
    TOTAL RAINFALL   (mm)=      72.26        72.26        72.26
    RUNOFF COEFFICIENT   =       0.99         0.43         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.

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--------------------
| ADD HYD   (0013) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0010):     3.87    1.159    1.40     55.67
        + ID2= 2 (0011):     0.91    0.098    1.40     26.46
          ==========================================================
          ID = 3 (0013):     4.78    1.257    1.40     50.11

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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ADD HYD (0013)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0013):	4.78	1.257	1.40	50.11
	+ ID2= 2 (0012):	6.86	2.005	1.40	55.67
	ID = 1 (0013):	11.64	3.263	1.40	53.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0013)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0013):	11.64	3.263	1.40	53.39
	+ ID2= 2 (0064):	2.95	0.631	1.40	41.28
	ID = 3 (0013):	14.59	3.894	1.40	50.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0021)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1	0.0000	0.0000	0.6510	0.4563
DT= 5.0 min	0.1220	0.1110	0.8770	0.7650
	0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	3.894	1.40	50.94
OUTFLOW: ID= 1 (0021)	14.590	0.625	1.80	50.92

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.05
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.4346

ROUTE PIPE (0031)		
IN= 2---> OUT= 1	Pipe Number	= 1.00
DT= 5.0 min	Diameter (mm)	=1650.00
	Length (m)	= 500.00
	Slope (m/m)	= 0.005
	Manning n	= 0.013

<TRAVEL TIME TABLE>

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.62	1.80	50.92	0.35	1.91
OUTFLOW: ID= 1 (0031)	14.59	0.63	1.90	50.92	0.35	1.91

CALIB				
NASHYD (0016)	Area (ha)=	6.53	Curve Number (CN)=	74.0
ID= 1 DT=12.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.19		

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.657 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 27.209
TOTAL RAINFALL (mm)= 72.259
RUNOFF COEFFICIENT = 0.377

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0018)	Area (ha)=	0.97		
ID= 1 DT=12.0 min	Total Imp(%)=	64.00	Dir. Conn.(%)=	64.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.62	0.35	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	141.24	63.75	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.88 (ii)	6.45 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.24	0.05	0.297 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	71.26	31.29	56.87
TOTAL RAINFALL (mm)=	72.26	72.26	72.26
RUNOFF COEFFICIENT =	0.99	0.43	0.79

***** 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 (0017)	Area (ha)=	2.34		
ID= 1 DT=12.0 min	Total Imp(%)=	55.00	Dir. Conn.(%)=	55.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.29	1.05	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	141.24	63.75	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.88 (ii)	6.45 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.50	0.16	0.667 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	71.26	31.29	53.27
TOTAL RAINFALL (mm)=	72.26	72.26	72.26
RUNOFF COEFFICIENT =	0.99	0.43	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 (0019)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0016):	6.53	0.657	1.40	27.21
	+ ID2= 2 (0017):	2.34	0.667	1.40	53.27

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          ID = 3 (0019):     8.87   1.325     1.40    34.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0019) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0019):     8.87   1.325     1.40    34.09
        + ID2= 2 (0018):     0.97   0.297     1.40    56.87
          ================================================
          ID = 1 (0019):     9.84   1.622     1.40    36.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0032) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0019):     9.84   1.622     1.40    36.33
        + ID2= 2 (0031):    14.59   0.626     1.90    50.92
          ================================================
          ID = 3 (0032):    24.43   1.915     1.40    45.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0022) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                          0.0000     0.0000    |   0.6510      0.4564
                          0.1220     0.0863    |   0.8770      0.7894
                          0.3620     0.1603    |   0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0032)     24.430     1.915      1.40      45.04
     OUTFLOW: ID= 1 (0022)     24.430     0.567      3.30      45.04

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 29.59
                    TIME SHIFT OF PEAK FLOW          (min)=114.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.3699

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--------------------
| CALIB            |
| NASHYD    (0023) |   Area     (ha)=  10.18   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   1.440

     PEAK FLOW       (cms)=   0.806 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  28.415
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.393

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0025) |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.229 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  27.882
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.386

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0027) |   Area     (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.183 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  23.392
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.324

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0024) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.76          1.95
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     141.24         63.75
               over (min)       12.00         12.00
     Storage Coeff.  (min)=       0.88 (ii)     6.45 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.87          0.30          2.170 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=      71.26         31.29          59.67
     TOTAL RAINFALL   (mm)=      72.26         72.26          72.26
     RUNOFF COEFFICIENT   =       0.99          0.43           0.83

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0062) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24          0.61
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     141.24         63.75
               over (min)       12.00         12.00
     Storage Coeff.  (min)=       0.88 (ii)     6.45 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.09          0.09          0.188 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=      71.26         31.29          42.48
     TOTAL RAINFALL   (mm)=      72.26         72.26          72.26
     RUNOFF COEFFICIENT   =       0.99          0.43           0.59

***** 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.

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| ADD HYD   (0028) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
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		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0023):	10.18	0.806	1.60	28.42
+	ID2= 2 (0024):	6.71	2.170	1.40	59.67
	ID = 3 (0028):	16.89	2.880	1.40	40.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) | 3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0028):	16.89	2.880	1.40	40.83
+	ID2= 2 (0025):	2.59	0.229	1.40	27.88
	ID = 1 (0028):	19.48	3.109	1.40	39.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) | 1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0028):	19.48	3.109	1.40	39.11
+	ID2= 2 (0027):	1.61	0.183	1.40	23.39
	ID = 3 (0028):	21.09	3.292	1.40	37.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0028) | 3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0028):	21.09	3.292	1.40	37.91
+	ID2= 2 (0062):	0.85	0.188	1.40	42.48
	ID = 1 (0028):	21.94	3.480	1.40	38.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0029) | 1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0022):	24.43	0.567	3.30	45.04
+	ID2= 2 (0028):	21.94	3.480	1.40	38.09
	ID = 3 (0029):	46.37	3.679	1.40	41.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030) | IN= 2---> OUT= 1 | DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.3030	1.3940
0.4380	0.4440	1.5000	1.8008
0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	3.679	1.40	41.75
OUTFLOW: ID= 1 (0030)	46.370	0.713	4.00	41.74

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.39
TIME SHIFT OF PEAK FLOW (min)=156.00
MAXIMUM STORAGE USED (ha.m.)= 0.7212

CALIB | NASHYD (0005) | ID= 1 DT= 5.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

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	4.27	1.083	33.54	2.083	9.99	3.08	5.08
0.167	4.27	1.167	33.54	2.167	9.99	3.17	5.08
0.250	4.89	1.250	189.72	2.250	8.52	3.25	4.72
0.333	4.89	1.333	189.72	2.333	8.52	3.33	4.72
0.417	5.75	1.417	44.29	2.417	7.46	3.42	4.41
0.500	5.75	1.500	44.29	2.500	7.46	3.50	4.41
0.583	7.05	1.583	22.84	2.583	6.65	3.58	4.15
0.667	7.05	1.667	22.84	2.667	6.65	3.67	4.15
0.750	9.24	1.750	15.74	2.750	6.02	3.75	3.91
0.833	9.24	1.833	15.74	2.833	6.02	3.83	3.91
0.917	13.94	1.917	12.16	2.917	5.50	3.92	3.71
1.000	13.94	2.000	12.16	3.000	5.50	4.00	3.71

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.170 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 28.619
TOTAL RAINFALL (mm)= 72.259
RUNOFF COEFFICIENT = 0.396

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0004) | ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	4.38	1.200	59.57	2.200	9.74	3.20	5.02
0.400	5.18	1.400	141.24	2.400	8.17	3.40	4.62
0.600	6.40	1.600	33.57	2.600	7.05	3.60	4.28
0.800	8.51	1.800	18.11	2.800	6.23	3.80	3.99
1.000	13.16	2.000	12.76	3.000	5.59	4.00	3.74

				TOTALS
Max.Eff.Inten.(mm/hr)=		141.24	63.75	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.88 (ii)	6.45 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
PEAK FLOW	(cms)=	0.36	0.08	0.445 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	71.26	31.29	56.87
TOTAL RAINFALL	(mm)=	72.26	72.26	72.26
RUNOFF COEFFICIENT	=	0.99	0.43	0.79

***** 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 (0063) | ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

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     Max.Eff.Inten.(mm/hr)=     141.24        63.75
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.88 (ii)    6.45 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.40         0.40        0.800 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40         1.40
     RUNOFF VOLUME    (mm)=     71.26        31.29        42.48
     TOTAL RAINFALL   (mm)=     72.26        72.26        72.26
     RUNOFF COEFFICIENT   =      0.99         0.43         0.59

***** 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.

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| ADD HYD   (0007) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0004):     1.45   0.445     1.40     56.87
       + ID2= 2 (0005):     1.33   0.170     1.42     28.62
         ================================================
         ID = 3 (0007):     2.78   0.588     1.42     43.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0007) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)      (mm)
         ID1= 3 (0007):     2.78   0.588     1.42     43.34
       + ID2= 2 (0063):     3.62   0.800     1.40     42.48
         ================================================
         ID = 1 (0007):     6.40   1.345     1.42     42.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0033) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000    |  0.3260     0.8017
                         0.0790     0.1850    |  0.3960     0.9004
                         0.2270     0.3947    |  0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0007)    6.400     1.345      1.42      42.86
     OUTFLOW: ID= 1 (0033)    6.400     0.090      2.75      42.77

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.68
                    TIME SHIFT OF PEAK FLOW          (min)= 80.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.2004

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-------------------
| ROUTE PIPE (0034)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 850.00
-------------------      Slope      (m/m)=  0.005
                         Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ---------------------->
       DEPTH      VOLUME     FLOW RATE    VELOCITY     TRAV.TIME
         (m)     (cu.m.)       (cms)        (m/s)         min
        0.09    .367E+02        0.0         0.80         17.68
        0.17    .102E+03        0.1         1.25         11.33
        0.26    .184E+03        0.3         1.61          8.81
        0.35    .278E+03        0.6         1.91          7.41
        0.43    .382E+03        1.0         2.18          6.51
        0.52    .492E+03        1.4         2.41          5.88
        0.61    .608E+03        1.9         2.61          5.43
        0.69    .727E+03        2.4         2.79          5.08
        0.78    .848E+03        2.9         2.95          4.81
        0.87    .970E+03        3.5         3.08          4.60
        0.96    .109E+04        4.1         3.20          4.43
        1.04    .121E+04        4.7         3.29          4.31
        1.13    .133E+04        5.2         3.36          4.22
        1.22    .144E+04        5.8         3.41          4.15
        1.30    .154E+04        6.2         3.44          4.12
        1.39    .163E+04        6.6         3.43          4.13
        1.48    .172E+04        6.9         3.40          4.17
        1.56    .178E+04        6.9         3.31          4.28
        1.65    .182E+04        6.5         3.02          4.70

                                   <---- hydrograph ---->   <-pipe / channel->
                                  AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                   (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0033)        6.40     0.09    2.75  42.77       0.13      0.97
     OUTFLOW: ID= 1 (0034)        6.40     0.09    2.92  42.76       0.13      0.96

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-------------------
| CALIB            |
| NASHYD    (0035) |   Area     (ha)=   8.03   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   1.394

     PEAK FLOW       (cms)=   0.711 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  27.882
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.386

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0037) |   Area     (ha)=  10.64   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.24

     Unit Hyd Qpeak  (cms)=   1.693

     PEAK FLOW       (cms)=   0.862 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  28.154
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.390

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0038) |   Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.169 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  28.343
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0036) |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------

                                   IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=           10.97          7.01
     Dep. Storage     (mm)=            1.00          1.50
     Average Slope     (%)=            2.00          2.00
     Length            (m)=           30.00         20.00
     Mannings n           =           0.013         0.250

     Max.Eff.Inten.(mm/hr)=          141.24         63.75
               over (min)            12.00         12.00
     Storage Coeff.  (min)=            0.88 (ii)     6.45 (ii)
     Unit Hyd. Tpeak (min)=           12.00         12.00
     Unit Hyd. peak  (cms)=            0.14          0.12
                                                          *TOTALS*
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PEAK FLOW	(cms)=	4.30	1.08	5.386 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	71.26	31.29	55.67
TOTAL RAINFALL	(mm)=	72.26	72.26	72.26
RUNOFF COEFFICIENT	=	0.99	0.43	0.77

***** 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 (0039) | Area (ha)= 1.21
ID= 1 DT=12.0 min | Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		141.24	63.75	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.88 (ii)	6.45 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.26	0.08	0.345 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	71.26	31.29	53.27
TOTAL RAINFALL	(mm)=	72.26	72.26	72.26
RUNOFF COEFFICIENT	=	0.99	0.43	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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.35	1.40	53.27
MAJOR SYS.(ID= 2):	0.24	0.18	1.40	53.27
MINOR SYS.(ID= 3):	0.97	0.17	1.40	53.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0047) | Area (ha)= 1.50
ID= 1 DT=12.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.96	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		141.24	63.75	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.88 (ii)	6.45 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.38	0.08	0.460 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	71.26	31.29	56.87
TOTAL RAINFALL	(mm)=	72.26	72.26	72.26
RUNOFF COEFFICIENT	=	0.99	0.43	0.79

***** 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.

DUHYD (0072)
Inlet Cap.=0.363
#of Inlets= 1
Total(cms)= 0.4

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.46	1.40	56.87
MAJOR SYS.(ID= 2):	0.12	0.10	1.40	56.87
MINOR SYS.(ID= 3):	1.38	0.36	1.40	56.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0035):	8.03	0.711	1.40	27.88
+ ID2= 2 (0036):	17.98	5.386	1.40	55.67
ID = 3 (0040):	26.01	6.097	1.40	47.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	26.01	6.097	1.40	47.09
+ ID2= 2 (0037):	10.64	0.862	1.60	28.15
ID = 1 (0040):	36.65	6.956	1.40	41.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	36.65	6.956	1.40	41.59
+ ID2= 2 (0038):	2.11	0.169	1.60	28.34
ID = 3 (0040):	38.76	7.110	1.40	40.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0040):	38.76	7.110	1.40	40.87
+ ID2= 2 (0072):	0.12	0.097	1.40	56.87
ID = 1 (0040):	38.88	7.207	1.40	40.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0040)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	38.88	7.207	1.40	40.92
+ ID2= 2 (0074):	0.24	0.176	1.40	53.27
ID = 3 (0040):	39.12	7.383	1.40	41.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0041) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0034):     6.40   0.089     2.92     42.76
       + ID2= 2 (0040):    39.12   7.383     1.40     41.00
         ================================================
         ID = 3 (0041):    45.52   7.051     1.42     41.26

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0043) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)     |    (cms)     (ha.m.)
                         0.0000     0.0000     |    3.1150     0.9004
                         1.2740     0.5550     |    3.6250     1.1600
                         2.2650     0.7154     |    3.9640     1.3570

                              AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (0041)     45.521     7.051      1.42      41.26
    OUTFLOW: ID= 1 (0043)     45.521     2.327      1.75      41.25

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 33.01
                  TIME SHIFT OF PEAK FLOW          (min)= 20.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7294

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0044) |   Area     (ha)=   3.28   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.10

    Unit Hyd Qpeak  (cms)=   1.253

    PEAK FLOW       (cms)=   0.319 (i)
    TIME TO PEAK    (hrs)=   1.400
    RUNOFF VOLUME    (mm)=  18.235
    TOTAL RAINFALL   (mm)=  72.259
    RUNOFF COEFFICIENT   =   0.252

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0046) |   Area     (ha)=   2.21   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.23

    Unit Hyd Qpeak  (cms)=   0.367

    PEAK FLOW       (cms)=   0.187 (i)
    TIME TO PEAK    (hrs)=   1.400
    RUNOFF VOLUME    (mm)=  28.031
    TOTAL RAINFALL   (mm)=  72.259
    RUNOFF COEFFICIENT   =   0.388

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0045) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      6.71         3.45
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=    141.24        63.75
              over (min)      12.00        12.00
    Storage Coeff.  (min)=     0.88 (ii)    6.45 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=     0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=     2.63         0.53          3.164 (iii)
    TIME TO PEAK    (hrs)=     1.40         1.40           1.40
    RUNOFF VOLUME    (mm)=    71.26        31.29          57.67
    TOTAL RAINFALL   (mm)=    72.26        72.26          72.26
    RUNOFF COEFFICIENT   =     0.99         0.43           0.80

***** 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.

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-------------------
| CALIB            |
| STANDHYD  (0059) |   Area     (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      0.86         0.41
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=    141.24        63.75
              over (min)      12.00        12.00
    Storage Coeff.  (min)=     0.88 (ii)    6.45 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=     0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=     0.34         0.06          0.402 (iii)
    TIME TO PEAK    (hrs)=     1.40         1.40           1.40
    RUNOFF VOLUME    (mm)=    71.26        31.29          58.46
    TOTAL RAINFALL   (mm)=    72.26        72.26          72.26
    RUNOFF COEFFICIENT   =     0.99         0.43           0.81

***** 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.

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-------------------
| DUHYD     (0069) |
| Inlet Cap.=0.320 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK     R.V.
-------------------        (ha)     (cms)     (hrs)     (mm)
    TOTAL HYD.(ID= 1):    1.27      0.40      1.40    58.46
    ================================================
    MAJOR SYS.(ID= 2):    0.10      0.08      1.40    58.46
    MINOR SYS.(ID= 3):    1.17      0.32      1.40    58.46

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0070) |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      1.38         1.12
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=    141.24        63.75
              over (min)      12.00        12.00
    Storage Coeff.  (min)=     0.88 (ii)    6.45 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=     0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=     0.54         0.17          0.713 (iii)
    TIME TO PEAK    (hrs)=     1.40         1.40           1.40
    RUNOFF VOLUME    (mm)=    71.26        31.29          53.27
    TOTAL RAINFALL   (mm)=    72.26        72.26          72.26
    RUNOFF COEFFICIENT   =     0.99         0.43           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.

DUHYD (0071)		AREA	QPEAK	TPEAK	R.V.
Inlet Cap.=0.550		(ha)	(cms)	(hrs)	(mm)
#of Inlets= 1					
Total(cms)= 0.6	TOTAL HYD.(ID= 1):	2.50	0.71	1.40	53.27
	MAJOR SYS.(ID= 2):	0.22	0.16	1.40	53.27
	MINOR SYS.(ID= 3):	2.28	0.55	1.40	53.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0044):	3.28	0.319	1.40	18.24
	+ ID2= 2 (0045):	10.16	3.164	1.40	57.67
	ID = 3 (0048):	13.44	3.483	1.40	48.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0048):	13.44	3.483	1.40	48.05
	+ ID2= 2 (0046):	2.21	0.187	1.40	28.03
	ID = 1 (0048):	15.65	3.670	1.40	45.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0048):	15.65	3.670	1.40	45.22
	+ ID2= 2 (0069):	1.17	0.320	1.40	58.46
	ID = 3 (0048):	16.82	3.990	1.40	46.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0048):	16.82	3.990	1.40	46.14
	+ ID2= 2 (0071):	2.28	0.550	1.40	53.27
	ID = 1 (0048):	19.10	4.540	1.40	46.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0048)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0048):	19.10	4.540	1.40	46.99
	+ ID2= 2 (0072):	1.38	0.363	1.40	56.87
	ID = 3 (0048):	20.48	4.903	1.40	47.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0049)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1	0.0000	0.0000	0.9630	0.3823
DT= 5.0 min	0.5430	0.1233	1.3030	0.6907
	0.7650	0.2343	1.5860	1.0977

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	20.476	4.903	1.40	47.66
OUTFLOW: ID= 1 (0049)	20.476	1.065	1.80	47.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.72
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.4779

ROUTE PIPE (0050)	
IN= 2---> OUT= 1	PIPE Number = 1.00
DT= 5.0 min	Diameter (mm)=1650.00
	Length (m)= 467.00
	Slope (m/m)= 0.006
	Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0049)	20.48	1.06	1.80	47.65	0.43	2.38
OUTFLOW: ID= 1 (0050)	20.48	1.07	1.80	47.65	0.43	2.38

CALIB NASHYD (0054) ID= 1 DT=12.0 min				
	Area (ha)=	1.34	Curve Number (CN)=	74.0
	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.22		

Unit Hyd Qpeak (cms)= 0.233

PEAK FLOW (cms)= 0.119 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 27.882
TOTAL RAINFALL (mm)= 72.259
RUNOFF COEFFICIENT = 0.386

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0056) ID= 1 DT=12.0 min				
	Area (ha)=	0.10	Curve Number (CN)=	74.0
	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.05		

Unit Hyd Qpeak (cms)= 0.076

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 2.486

```
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.034

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0058) |   Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.199 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  28.415
     TOTAL RAINFALL   (mm)=  72.259
     RUNOFF COEFFICIENT   =   0.393

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0057) |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.33         0.14
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     141.24        63.75
           over (min)            12.00        12.00
     Storage Coeff.  (min)=       0.88 (ii)    6.45 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.02         0.151 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40          1.40
     RUNOFF VOLUME    (mm)=      71.26        31.29         59.26
     TOTAL RAINFALL   (mm)=      72.26        72.26         72.26
     RUNOFF COEFFICIENT   =       0.99         0.43          0.82

***** 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   (0073) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0057):     0.47   0.151     1.40    59.26
        + ID2= 2 (0058):     2.51   0.199     1.60    28.42
          ================================================
          ID = 3 (0073):     2.98   0.326     1.40    33.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| DUHYD     (0066) |
| Inlet Cap.=0.181 |
| #of Inlets=    1 |
| Total(cms)=  0.2 |       AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.98      0.33      1.40    33.28
     ================================================
     MAJOR SYS.(ID= 2):   0.44      0.15      1.40    33.28
     MINOR SYS.(ID= 3):   2.54      0.18      1.40    33.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0053) |   Area     (ha)=   5.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.28         2.58
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     141.24        63.75
           over (min)            12.00        12.00
     Storage Coeff.  (min)=       0.88 (ii)    6.45 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.29         0.40          1.686 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40          1.40
     RUNOFF VOLUME    (mm)=      71.26        31.29         53.67
     TOTAL RAINFALL   (mm)=      72.26        72.26         72.26
     RUNOFF COEFFICIENT   =       0.99         0.43          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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0055) |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     141.24        63.75
           over (min)            12.00        12.00
     Storage Coeff.  (min)=       0.88 (ii)    6.45 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.31          0.580 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40          1.40
     RUNOFF VOLUME    (mm)=      71.26        31.29         41.28
     TOTAL RAINFALL   (mm)=      72.26        72.26         72.26
     RUNOFF COEFFICIENT   =       0.99         0.43          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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0065) |   Area     (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     141.24        63.75
           over (min)            12.00        12.00
     Storage Coeff.  (min)=       0.88 (ii)    6.45 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.31          0.580 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.40          1.40
     RUNOFF VOLUME    (mm)=      71.26        31.29         41.28
     TOTAL RAINFALL   (mm)=      72.26        72.26         72.26
     RUNOFF COEFFICIENT   =       0.99         0.43          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 (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0053):		5.86	1.686	1.40	53.67
+ ID2= 2 (0054):		1.34	0.119	1.40	27.88
ID = 3 (0051):		7.20	1.804	1.40	48.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		7.20	1.804	1.40	48.87
+ ID2= 2 (0055):		2.71	0.580	1.40	41.28
ID = 1 (0051):		9.91	2.384	1.40	46.80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0051):		9.91	2.384	1.40	46.80
+ ID2= 2 (0056):		0.10	0.001	1.40	2.49
ID = 3 (0051):		10.01	2.385	1.40	46.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		10.01	2.385	1.40	46.35
+ ID2= 2 (0065):		2.71	0.580	1.40	41.28
ID = 1 (0051):		12.72	2.965	1.40	45.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0051):		12.72	2.965	1.40	45.27
+ ID2= 2 (0066):		2.54	0.181	1.40	33.28
ID = 3 (0051):		15.26	3.146	1.40	43.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0051):		15.26	3.146	1.40	43.28
+ ID2= 2 (0069):		0.10	0.082	1.40	58.46
ID = 1 (0051):		15.36	3.227	1.40	43.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0060)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0050):		20.48	1.067	1.80	47.65
+ ID2= 2 (0051):		15.36	3.227	1.40	43.38
ID = 3 (0060):		35.84	3.987	1.40	45.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0061)	OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1	(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min	0.0000	0.0000	0.5100	0.3577
	0.2970	0.1233	0.6800	0.7154
	0.4250	0.2220	0.7930	1.1964

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0060)	35.837	3.987	1.40	45.82
OUTFLOW: ID= 1 (0061)	35.837	0.713	3.70	45.82

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.87
TIME SHIFT OF PEAK FLOW (min)=138.00
MAXIMUM STORAGE USED (ha.m.)= 0.8543

****
** SIMULATION NUMBER: 6 **
****

CHICAGO STORM	IDF curve parameters: A=1770.000
Ptotal= 78.03 mm	B= 4.000
	C= 0.820

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 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
0.17	4.34	1.17	38.21	2.17	10.60	3.17	5.19
0.33	5.00	1.33	203.31	2.33	8.96	3.33	4.81
0.50	5.92	1.50	50.96	2.50	7.78	3.50	4.48
0.67	7.33	1.67	25.51	2.67	6.90	3.67	4.20
0.83	9.77	1.83	17.18	2.83	6.21	3.83	3.96
1.00	15.10	2.00	13.06	3.00	5.65	4.00	3.74

CALIB					
NASHYD (0011)	Area	(ha)=	0.91	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.17		

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	4.45	1.200	65.72	2.200	10.32	3.20	5.13
0.400	5.30	1.400	152.52	2.400	8.56	3.40	4.70
0.600	6.63	1.600	38.23	2.600	7.34	3.60	4.34
0.800	8.95	1.800	19.96	2.800	6.44	3.80	4.04
1.000	14.21	2.000	13.75	3.000	5.74	4.00	3.78

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.113 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 30.080
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.386

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB                                |   Area    (ha)=   3.87
| STANDHYD  (0010)                     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
| ID= 1 DT=12.0 min                    |
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.36	1.51	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	0.85 (ii)	6.15 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.00	0.27	1.268 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	60.76
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.78

***** 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                                |   Area    (ha)=   6.86
| STANDHYD  (0012)                     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
| ID= 1 DT=12.0 min                    |
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	213.85	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	2.77 (ii)	8.06 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	1.76	0.44	2.197 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	60.76
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.78

***** 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                                |   Area    (ha)=   2.95
| STANDHYD  (0064)                     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
| ID= 1 DT=12.0 min                    |
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.74	2.21	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	0.85 (ii)	6.15 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.31	0.39	0.706 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	45.75
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.59

***** 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   (0013)                     |
|   1 +  2 =  3                        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	3.87	1.268	1.40	60.76
+ ID2= 2 (0011):	0.91	0.113	1.40	30.08
ID = 3 (0013):	4.78	1.381	1.40	54.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0013)                     |
|   3 +  2 =  1                        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0013):	4.78	1.381	1.40	54.92
+ ID2= 2 (0012):	6.86	2.197	1.40	60.76
ID = 1 (0013):	11.64	3.578	1.40	58.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0013)                     |
|   1 +  2 =  3                        |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	11.64	3.578	1.40	58.37
+ ID2= 2 (0064):	2.95	0.706	1.40	45.75
ID = 3 (0013):	14.59	4.284	1.40	55.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| RESERVOIR (0021)                     |
| IN= 2---> OUT= 1                     |
| DT=  5.0 min                         |
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0013)	14.590	4.284	1.40	55.81
OUTFLOW: ID= 1 (0021)	14.590	0.671	1.80	55.80

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.66
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.4844

```
| ROUTE PIPE (0031)                    |   PIPE Number     =   1.00
| IN= 2---> OUT= 1                     |   Diameter    (mm)=1650.00
| DT=  5.0 min                         |   Length      (m)= 500.00
                                         Slope      (m/m)=  0.005
                                         Manning n      =  0.013
```

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18

0.35	.164E+03	0.6	1.91	4.36	
0.43	.225E+03	1.0	2.18	3.83	
0.52	.290E+03	1.4	2.41	3.46	
0.61	.358E+03	1.9	2.61	3.19	
0.69	.428E+03	2.4	2.79	2.99	
0.78	.499E+03	2.9	2.95	2.83	
0.87	.570E+03	3.5	3.08	2.70	
0.96	.642E+03	4.1	3.20	2.61	
1.04	.712E+03	4.7	3.29	2.53	
1.13	.780E+03	5.2	3.36	2.48	
1.22	.844E+03	5.8	3.41	2.44	
1.30	.905E+03	6.2	3.44	2.43	
1.39	.961E+03	6.6	3.43	2.43	
1.48	.101E+04	6.9	3.40	2.45	
1.56	.105E+04	6.9	3.31	2.52	
1.65	.107E+04	6.5	3.02	2.76	

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0021)	14.59	0.67	1.80	55.80	0.36	1.94
OUTFLOW: ID= 1 (0031)	14.59	0.67	1.90	55.80	0.36	1.94

CALIB
NASHYD (0016)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.756 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 30.937
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.396

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0018)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.62	0.35
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	152.52	72.37
over (min)	12.00	12.00
Storage Coeff. (min)=	0.85 (ii)	6.15 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

	TOTALS
PEAK FLOW (cms)=	0.326 (iii)
TIME TO PEAK (hrs)=	1.40
RUNOFF VOLUME (mm)=	62.01
TOTAL RAINFALL (mm)=	78.03
RUNOFF COEFFICIENT =	0.79

***** 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 (0017)
ID= 1 DT=12.0 min

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.29	1.05
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	152.52	72.37
over (min)	12.00	12.00
Storage Coeff. (min)=	0.85 (ii)	6.15 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

	TOTALS
PEAK FLOW (cms)=	0.732 (iii)
TIME TO PEAK (hrs)=	1.40
RUNOFF VOLUME (mm)=	58.26
TOTAL RAINFALL (mm)=	78.03
RUNOFF COEFFICIENT =	0.75

***** 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 (0019)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0016):	6.53	0.756	1.40	30.94
+ ID2= 2 (0017):	2.34	0.732	1.40	58.26
ID = 3 (0019):	8.87	1.489	1.40	38.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0019):	8.87	1.489	1.40	38.15
+ ID2= 2 (0018):	0.97	0.325	1.40	62.01
ID = 1 (0019):	9.84	1.814	1.40	40.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0019):	9.84	1.814	1.40	40.50
+ ID2= 2 (0031):	14.59	0.671	1.90	55.80
ID = 3 (0032):	24.43	2.146	1.40	49.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0022)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0032)	24.430	2.146	1.40	49.64
OUTFLOW: ID= 1 (0022)	24.430	0.612	3.30	49.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 28.52
TIME SHIFT OF PEAK FLOW (min)=114.00
MAXIMUM STORAGE USED (ha.m.)= 0.4167

CALIB
NASHYD (0023)
ID= 1 DT=12.0 min

Area (ha)= 10.18 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 1.440

```
     PEAK FLOW       (cms)=   0.936 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  32.308
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.414

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0025) |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.264 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  31.701
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.406

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0027) |   Area     (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.209 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  26.596
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.341

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0024) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.76         1.95
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    152.52        72.37
           over (min)          12.00        12.00
     Storage Coeff.  (min)=     0.85 (ii)    6.15 (ii)
     Unit Hyd. Tpeak (min)=    12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     2.02         0.35          2.364 (iii)
     TIME TO PEAK    (hrs)=     1.40         1.40          1.40
     RUNOFF VOLUME    (mm)=    77.03        35.33         64.93
     TOTAL RAINFALL   (mm)=    78.03        78.03         78.03
     RUNOFF COEFFICIENT   =     0.99         0.45          0.83

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0062) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.61
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    152.52        72.37
           over (min)          12.00        12.00
     Storage Coeff.  (min)=     0.85 (ii)    6.15 (ii)
     Unit Hyd. Tpeak (min)=    12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.10         0.11          0.210 (iii)
     TIME TO PEAK    (hrs)=     1.40         1.40          1.40
     RUNOFF VOLUME    (mm)=    77.03        35.33         46.99
     TOTAL RAINFALL   (mm)=    78.03        78.03         78.03
     RUNOFF COEFFICIENT   =     0.99         0.45          0.60

***** 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.

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--------------------
| ADD HYD   (0028) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0023):    10.18    0.936     1.60    32.31
        + ID2= 2 (0024):     6.71    2.364     1.40    64.93
          ================================================
          ID = 3 (0028):    16.89    3.185     1.40    45.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0028) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0028):    16.89    3.185     1.40    45.27
        + ID2= 2 (0025):     2.59    0.264     1.40    31.70
          ================================================
          ID = 1 (0028):    19.48    3.449     1.40    43.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0028) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0028):    19.48    3.449     1.40    43.47
        + ID2= 2 (0027):     1.61    0.209     1.40    26.60
          ================================================
          ID = 3 (0028):    21.09    3.658     1.40    42.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0028) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0028):    21.09    3.658     1.40    42.18
        + ID2= 2 (0062):     0.85    0.210     1.40    46.99
          ================================================
          ID = 1 (0028):    21.94    3.868     1.40    42.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0029) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0022):    24.43    0.612     3.30    49.63
        + ID2= 2 (0028):    21.94    3.868     1.40    42.36
          ================================================
          ID = 3 (0029):    46.37    4.109     1.40    46.19
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0030) IN= 2---> OUT= 1 DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.3030	1.3940
	0.4380	0.4440	1.5000	1.8008
	0.9910	1.0000	1.7560	2.3930

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0029)	46.370	4.109	1.40	46.19
OUTFLOW: ID= 1 (0030)	46.370	0.781	4.00	46.19

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.01
TIME SHIFT OF PEAK FLOW (min)=156.00
MAXIMUM STORAGE USED (ha.m.)= 0.7889

CALIB NASHYD (0005) ID= 1 DT= 5.0 min | Area (ha)= 1.33 | Curve Number (CN)= 74.0 | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.13

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	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.196 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 32.539
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.417

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0004) ID= 1 DT=12.0 min | Area (ha)= 1.45 | Total Imp(%)= 64.00 | Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.93	0.52
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 12.0 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
0.200	4.45	1.200	65.72	2.200	10.32	3.20	5.13
0.400	5.30	1.400	152.52	2.400	8.56	3.40	4.70
0.600	6.63	1.600	38.23	2.600	7.34	3.60	4.34
0.800	8.95	1.800	19.96	2.800	6.44	3.80	4.04
1.000	14.21	2.000	13.75	3.000	5.74	4.00	3.78

Max.Eff.Inten.(mm/hr)=	152.52	72.37
over (min)	12.00	12.00
Storage Coeff. (min)=	0.85 (ii)	6.15 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

		TOTALS
PEAK FLOW (cms)=	0.39	0.486 (iii)
TIME TO PEAK (hrs)=	1.40	1.40
RUNOFF VOLUME (mm)=	77.03	35.33	62.01
TOTAL RAINFALL (mm)=	78.03	78.03
RUNOFF COEFFICIENT =	0.99	0.45	0.79

***** 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 (0063) ID= 1 DT=12.0 min | Area (ha)= 3.62 | Total Imp(%)= 28.00 | Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.01	2.61
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	152.52	72.37
over (min)	12.00	12.00
Storage Coeff. (min)=	0.85 (ii)	6.15 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

		TOTALS
PEAK FLOW (cms)=	0.43	0.46	0.893 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	77.03	35.33	47.00
TOTAL RAINFALL (mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT =	0.99	0.45	0.60

***** 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 (0007) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	1.45	0.486	1.40	62.01
+ ID2= 2 (0005):	1.33	0.196	1.42	32.54
ID = 3 (0007):	2.78	0.653	1.42	47.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	2.78	0.653	1.42	47.90
+ ID2= 2 (0063):	3.62	0.893	1.40	47.00
ID = 1 (0007):	6.40	1.498	1.42	47.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0033) IN= 2---> OUT= 1 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3260	0.8017
0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA	QPEAK	TPEAK	R.V.

	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0007)	6.400	1.498	1.42	47.40
OUTFLOW: ID= 1 (0033)	6.400	0.105	2.58	47.31

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.00
TIME SHIFT OF PEAK FLOW (min)= 70.00
MAXIMUM STORAGE USED (ha.m.)= 0.2216

ROUTE PIPE (0034)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0033)	6.40	0.10	2.58	47.31	0.14	1.03
OUTFLOW: ID= 1 (0034)	6.40	0.10	2.83	47.30	0.14	1.02

CALIB
NASHYD (0035)
ID= 1 DT=12.0 min

Area (ha)= 8.03 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 1.394

PEAK FLOW (cms)= 0.820 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 31.701
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.406

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0037)
ID= 1 DT=12.0 min

Area (ha)= 10.64 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 1.693

PEAK FLOW (cms)= 1.001 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 32.011
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.410

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0038)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.196 (i)
TIME TO PEAK (hrs)= 1.600
RUNOFF VOLUME (mm)= 32.225
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.413

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0036)
ID= 1 DT=12.0 min

Area (ha)= 17.98
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	10.97	7.01	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	0.85 (ii)	6.15 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	4.65	1.25	5.893 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	60.76
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.78

***** 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 (0039)
ID= 1 DT=12.0 min

Area (ha)= 1.21
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	0.85 (ii)	6.15 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.28	0.10	0.379 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	58.26
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.75

***** 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.

DUHYD (0074)
Inlet Cap.=0.169
#of Inlets= 1
Total(cms)= 0.2

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.21	0.38	1.40	58.26
MAJOR SYS.(ID= 2):	0.26	0.21	1.40	58.26

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     MINOR SYS.(ID= 3):   0.95      0.17      1.40   58.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB
| STANDHYD  (0047)  |   Area    (ha)=   1.50
|ID= 1 DT=12.0 min  |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.96         0.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =       0.013        0.250

     Max.Eff.Inten.(mm/hr)=     152.52        72.37
           over (min)          12.00        12.00
     Storage Coeff.  (min)=      0.85 (ii)    6.15 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.41         0.10        0.503 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40         1.40
     RUNOFF VOLUME    (mm)=     77.03        35.33        62.01
     TOTAL RAINFALL   (mm)=     78.03        78.03        78.03
     RUNOFF COEFFICIENT   =      0.99         0.45         0.79

***** 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.

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-------------------
| DUHYD     (0072)  |
| Inlet Cap.=0.363  |
| #of Inlets=    1  |
| Total(cms)=  0.4  |       AREA     QPEAK     TPEAK    R.V.
-------------------       (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.50      0.50      1.40   62.01
     ==========================================================
     MAJOR SYS.(ID= 2):   0.16      0.14      1.40   62.01
     MINOR SYS.(ID= 3):   1.34      0.36      1.40   62.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0040)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0035):      8.03    0.820     1.40    31.70
        + ID2= 2 (0036):     17.98    5.893     1.40    60.76
          ================================================
          ID = 3 (0040):     26.01    6.713     1.40    51.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0040):     26.01    6.713     1.40    51.79
        + ID2= 2 (0037):     10.64    1.001     1.60    32.01
          ================================================
          ID = 1 (0040):     36.65    7.703     1.40    46.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0040)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0040):     36.65    7.703     1.40    46.05
        + ID2= 2 (0038):      2.11    0.196     1.60    32.23
          ================================================
          ID = 3 (0040):     38.76    7.882     1.40    45.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0040)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0040):     38.76    7.882     1.40    45.30
        + ID2= 2 (0072):      0.16    0.140     1.40    62.01
          ================================================
          ID = 1 (0040):     38.92    8.021     1.40    45.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0040)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0040):     38.92    8.021     1.40    45.37
        + ID2= 2 (0074):      0.26    0.210     1.40    58.26
          ================================================
          ID = 3 (0040):     39.18    8.231     1.40    45.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0041)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0034):      6.40    0.104     2.83    47.30
        + ID2= 2 (0040):     39.18    8.231     1.40    45.45
          ================================================
          ID = 3 (0041):     45.58    7.871     1.42    45.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0043)  |
| IN= 2---> OUT= 1  |
| DT=  5.0 min      |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   3.1150     0.9004
                          1.2740     0.5550    |   3.6250     1.1600
                          2.2650     0.7154    |   3.9640     1.3570

                                AREA     QPEAK     TPEAK      R.V.
                                (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0041)     45.581     7.871     1.42      45.72
     OUTFLOW: ID= 1 (0043)     45.581     2.684     1.75      45.72

               PEAK   FLOW   REDUCTION [Qout/Qin](%)= 34.10
               TIME SHIFT OF PEAK FLOW         (min)= 20.00
               MAXIMUM  STORAGE   USED        (ha.m.)=  0.8074

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0044)  |   Area    (ha)=   3.28   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.10

     Unit Hyd Qpeak  (cms)=   1.253

     PEAK FLOW       (cms)=   0.365 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  20.733
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.266

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB             |
| NASHYD    (0046)  |   Area    (ha)=   2.21   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.23
```

```
     Unit Hyd Qpeak  (cms)=   0.367

     PEAK FLOW       (cms)=   0.216 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  31.870
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.408

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0045)|   Area     (ha)=  10.16
|ID= 1 DT=12.0 min|   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      6.71          3.45
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=    152.52         72.37
               over (min)       12.00         12.00
     Storage Coeff.  (min)=     0.85 (ii)     6.15 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=     0.14          0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     2.84          0.61          3.455 (iii)
     TIME TO PEAK    (hrs)=     1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=    77.03         35.33          62.85
     TOTAL RAINFALL   (mm)=    78.03         78.03          78.03
     RUNOFF COEFFICIENT   =     0.99          0.45           0.81

***** 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  (0059)|   Area     (ha)=   1.27
|ID= 1 DT=12.0 min|   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.86          0.41
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=    152.52         72.37
               over (min)       12.00         12.00
     Storage Coeff.  (min)=     0.85 (ii)     6.15 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=     0.14          0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     0.37          0.07          0.438 (iii)
     TIME TO PEAK    (hrs)=     1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=    77.03         35.33          63.68
     TOTAL RAINFALL   (mm)=    78.03         78.03          78.03
     RUNOFF COEFFICIENT   =     0.99          0.45           0.82

***** 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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0069)|
| Inlet Cap.=0.320|
| #of Inlets=   1 |
| Total(cms)=  0.3|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.27      0.44      1.40   63.68
     ======================================================
     MAJOR SYS.(ID= 2):   0.13      0.12      1.40   63.68
     MINOR SYS.(ID= 3):   1.14      0.32      1.40   63.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD  (0070)|   Area     (ha)=   2.50
|ID= 1 DT=12.0 min|   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.38          1.12
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=    152.52         72.37
               over (min)       12.00         12.00
     Storage Coeff.  (min)=     0.85 (ii)     6.15 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=     0.14          0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     0.58          0.20          0.783 (iii)
     TIME TO PEAK    (hrs)=     1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=    77.03         35.33          58.26
     TOTAL RAINFALL   (mm)=    78.03         78.03          78.03
     RUNOFF COEFFICIENT   =     0.99          0.45           0.75

***** 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.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0071)|
| Inlet Cap.=0.550|
| #of Inlets=   1 |
| Total(cms)=  0.6|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.50      0.78      1.40   58.26
     ======================================================
     MAJOR SYS.(ID= 2):   0.29      0.23      1.40   58.26
     MINOR SYS.(ID= 3):   2.21      0.55      1.40   58.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0044):     3.28   0.365     1.40    20.73
        + ID2= 2 (0045):    10.16   3.455     1.40    62.85
          ================================================
          ID = 3 (0048):    13.44   3.821     1.40    52.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0048):    13.44   3.821     1.40    52.57
        + ID2= 2 (0046):     2.21   0.216     1.40    31.87
          ================================================
          ID = 1 (0048):    15.65   4.036     1.40    49.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0048)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0048):    15.65   4.036     1.40    49.65
        + ID2= 2 (0069):     1.14   0.320     1.40    63.68
          ================================================
```

```
          ID = 3 (0048):    16.79   4.356     1.40    50.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0048) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0048):    16.79   4.356     1.40    50.60
        + ID2= 2 (0071):     2.21   0.550     1.40    58.26
          ================================================
          ID = 1 (0048):    19.00   4.906     1.40    51.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0048) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0048):    19.00   4.906     1.40    51.49
        + ID2= 2 (0072):     1.34   0.363     1.40    62.01
          ================================================
          ID = 3 (0048):    20.34   5.269     1.40    52.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0049) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)     |    (cms)     (ha.m.)
                         0.0000     0.0000     |   0.9630     0.3823
                         0.5430     0.1233     |   1.3030     0.6907
                         0.7650     0.2343     |   1.5860     1.0977

                                  AREA     QPEAK     TPEAK       R.V.
                                   (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0048)      20.337     5.269      1.40      52.18
     OUTFLOW: ID= 1 (0049)      20.337     1.126      1.80      52.18

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 21.36
                   TIME SHIFT OF PEAK FLOW          (min)= 24.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=  0.5321

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-------------------
| ROUTE PIPE (0050)|     PIPE Number     =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 467.00
-------------------      Slope      (m/m)=  0.006
                         Manning n       =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE    VELOCITY    TRAV.TIME
         (m)     (cu.m.)       (cms)        (m/s)        min
        0.09    .201E+02         0.0         0.88         8.87
        0.17    .560E+02         0.2         1.37         5.68
        0.26    .101E+03         0.4         1.76         4.42
        0.35    .153E+03         0.7         2.09         3.72
        0.43    .210E+03         1.1         2.38         3.27
        0.52    .270E+03         1.5         2.64         2.95
        0.61    .334E+03         2.0         2.86         2.72
        0.69    .399E+03         2.6         3.06         2.55
        0.78    .466E+03         3.2         3.23         2.41
        0.87    .533E+03         3.9         3.38         2.31
        0.96    .599E+03         4.5         3.50         2.22
        1.04    .665E+03         5.1         3.60         2.16
        1.13    .728E+03         5.7         3.68         2.11
        1.22    .789E+03         6.3         3.74         2.08
        1.30    .846E+03         6.8         3.76         2.07
        1.39    .897E+03         7.2         3.76         2.07
        1.48    .943E+03         7.5         3.72         2.09
        1.56    .978E+03         7.6         3.63         2.15
        1.65    .999E+03         7.1         3.30         2.36
                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                                 (ha)    (cms)    (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0049)    20.34     1.13     1.80  52.18      0.44      2.41
     OUTFLOW: ID= 1 (0050)    20.34     1.13     1.80  52.18      0.44      2.41
```

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--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0054) |   Area     (ha)=   1.34   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.233

     PEAK FLOW       (cms)=   0.137 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  31.701
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.406

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0056) |   Area     (ha)=   0.10   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.05

     Unit Hyd Qpeak  (cms)=   0.076

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=   2.826
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.036

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0058) |   Area     (ha)=   2.51   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.355

     PEAK FLOW       (cms)=   0.231 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=  32.308
     TOTAL RAINFALL   (mm)=  78.027
     RUNOFF COEFFICIENT   =   0.414

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD  (0057) |   Area     (ha)=   0.47
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=        0.33          0.14
     Dep. Storage      (mm)=        1.00          1.50
     Average Slope      (%)=        2.00          2.00
     Length             (m)=       30.00         20.00
     Mannings n            =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      152.52         72.37
               over (min)         12.00         12.00
     Storage Coeff.  (min)=        0.85 (ii)     6.15 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.14          0.03          0.164 (iii)
     TIME TO PEAK    (hrs)=        1.40          1.40           1.40
     RUNOFF VOLUME    (mm)=       77.03         35.33          64.51
     TOTAL RAINFALL   (mm)=       78.03         78.03          78.03
     RUNOFF COEFFICIENT   =        0.99          0.45           0.83

***** 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.

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ADD HYD (0073)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0057):	0.47	0.164	1.40	64.51
	+ ID2= 2 (0058):	2.51	0.231	1.60	32.31
	= ID = 3 (0073):	2.98	0.367	1.40	37.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0066)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
Inlet Cap.=0.181					
#of Inlets= 1					
Total(cms)= 0.2	TOTAL HYD.(ID= 1):	2.98	0.37	1.40	37.39
	MAJOR SYS.(ID= 2):	0.57	0.19	1.40	37.39
	MINOR SYS.(ID= 3):	2.41	0.18	1.40	37.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0053) | Area (ha)= 5.86
ID= 1 DT=12.0 min | Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.28	2.58	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.85 (ii)	6.15 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.39	0.46	1.849 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	58.68
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.75

***** 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 (0055) | Area (ha)= 2.71
ID= 1 DT=12.0 min | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.85 (ii)	6.15 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.29	0.36	0.648 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	45.75
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.59

***** 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 (0065) | Area (ha)= 2.71
ID= 1 DT=12.0 min | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		152.52	72.37	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.85 (ii)	6.15 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.29	0.36	0.648 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	77.03	35.33	45.75
TOTAL RAINFALL	(mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT	=	0.99	0.45	0.59

***** 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 (0051)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0053):	5.86	1.849	1.40	58.68
	+ ID2= 2 (0054):	1.34	0.137	1.40	31.70
	= ID = 3 (0051):	7.20	1.985	1.40	53.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1	ID1= 3 (0051):	7.20	1.985	1.40	53.66
	+ ID2= 2 (0055):	2.71	0.648	1.40	45.75
	= ID = 1 (0051):	9.91	2.634	1.40	51.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0051):	9.91	2.634	1.40	51.50
	+ ID2= 2 (0056):	0.10	0.002	1.40	2.83
	= ID = 3 (0051):	10.01	2.635	1.40	51.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0051)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1	ID1= 3 (0051):	10.01	2.635	1.40	51.01
	+ ID2= 2 (0065):	2.71	0.648	1.40	45.75
	=				

```
          ID = 1 (0051):    12.72   3.284     1.40    49.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0051):    12.72   3.284     1.40    49.89
        + ID2= 2 (0066):     2.41   0.181     1.40    37.39
          ================================================
          ID = 3 (0051):    15.13   3.465     1.40    47.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0051) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0051):    15.13   3.465     1.40    47.90
        + ID2= 2 (0069):     0.13   0.118     1.40    63.68
          ================================================
          ID = 1 (0051):    15.26   3.583     1.40    48.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0060) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0050):    20.34   1.126     1.80    52.18
        + ID2= 2 (0051):    15.26   3.583     1.40    48.04
          ================================================
          ID = 3 (0060):    35.60   4.381     1.40    50.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0061) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)     |   (cms)     (ha.m.)
                        0.0000     0.0000     |  0.5100      0.3577
                        0.2970     0.1233     |  0.6800      0.7154
                        0.4250     0.2220     |  0.7930      1.1964

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0060)     35.599     4.381     1.40       50.40
     OUTFLOW: ID= 1 (0061)     35.599     0.736     3.90       50.40

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.81
                   TIME SHIFT OF PEAK FLOW          (min)=150.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.9556

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 FINISH
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APPENDIX E
Post-Development Input Parameters

COLE ENGINEERING

Post-Development (OTTHYMO) Nashyd Input Parameters

Glenway Estates
File No. L09-301
Date: July 2013

Parameter	Unit	Description	4-ex2.3	4-ex1.1	4.3	4.5	6-ex3.3	6.4
Area	ha	Watershed Area	0.91	6.53	2.59	1.61	1.33	2.11
TP	hr	Unit Hydrograph Time to Peak	0.17	0.19	0.22	0.13	0.13	0.26
DT	min	Time Step Increment	12					
DWF	cms	Dry Weather Flow (Base Flow)	0					
CN*	-	Modified SCS Curve Number	74**					
IA	mm	Initial Abstraction	5					
N	-	Number of Linear Reservior	3					
Rain	mm/hr	Optional Rainfall Intensities	0-Without Rainfall					

**** Note: Based on clay loam soil (Type C) determined from a soils map of York County (Soil Surveys Ontario). CN value of 74 was determined with MTO Design Charts 1.08 and 1.09 for pasture land use under good hydrologic condition. CN value was converted to CN*.**

Time of Concentration Calculation

Area Number	Area	C_{PRE}	L	Elevation Change	Sw	Tp (Airport)
	(ha)		(m)	(m)	(m/m)	(hr)
4-ex2.3	0.91	0.30	60	2	2.5	0.17
4-ex1.1	6.53	0.30	200	20	10.0	0.19
4.3	2.59	0.20	210	20	9.5	0.22
4.5	1.61	0.20	85	10	11.8	0.13
6-ex3.3	1.33	0.20	70	7	10.0	0.13
6.4	2.11	0.20	200	12	6.0	0.26

Post-Development (OTTHYMO)
STANDHYD - Input Parameters

Glenway Estates
File No. L09-301
Date: November 2013

Parameter	Units	Description	4-ex2.1	4-ex2.2	4-ex2.4	4-ex1.2	4-ex1.3	4.1	4.2	4.4	4.6	6-ex3.1	6-ex3.2	6.1	6.2	6.3	6.01	68.1	8.01	8.1	8.2	98.1	9.1	9.2	9.3	9.4	9.02	9.03
AREA	ha	Drainage Area	2.95	3.87	6.86	2.34	0.97	10.18	6.71	0.85	2.21	3.62	1.45	8.53	17.98	10.64	1.21	1.50	2.50	3.28	10.16	1.27	2.25	5.86	1.34	2.71	0.47	1.34
XIMP	%	Impervious Area (Direct Connection)	25.0%	61.0%	61.0%	55.0%	64.0%	75.0%	80.0%	28.0%	85.0%	28.0%	64.0%	68.0%	61.0%	70.0%	55.0%	64.0%	55.0%	70.0%	66.0%	68.0%	60.0%	56.0%	75.0%	78.0%	70.0%	75.0%
TIMP	%	Total Impervious Area	25.0%	61.0%	61.0%	55.0%	64.0%	75.0%	80.0%	28.0%	85.0%	28.0%	64.0%	68.0%	61.0%	70.0%	55.0%	64.0%	55.0%	70.0%	66.0%	68.0%	60.0%	56.0%	75.0%	78.0%	70.0%	75.0%
LGI	-	Overland Flow Length (Impervious)	30																									
SLPI	%	Average Slope (Impervious)	2																									
DT	min	Time Step Increment	12																									
DWF	m^3/s	Dry Weather Flow (Base Flow)	0																									
LOSS	-	Rainfall Loss Method	Loss = 2 - Modified SCS Curve Method, CN*= 74																									
SLPP	%	Average Slope (Pervious)	2																									
LGP	m	Overland Flow Length (Pervious)	20																									
MNP	-	Manning's Roughness Coefficient (Pervious)	0.25																									
DPSI	mm	Depression Storage (Impervious)	1																									
MNI	-	Manning's Roughness Coefficient (Impervious)	0.013																									

APPENDIX F
Proposed Pond Design SSD Tables

COLE ENGINEERING

Stage - Storage - Discharge Curve
Pond 4
L09-301
November 20, 2013

		c	diam / length	control elev	inv				
	BottomDraw	0.63	0.200	269.800	269.70				
	Ditch Inlet (MTO Chart 4.20)			270.350		0.6 m W Ditch Inlet CB (2:1 grate slope)			
	CB orifice tube	0.80	0.200	269.800	269.70				
	Weir / Channel	1.67	25.000	271.700		25m base broad crested weir			

	depth (m)	elev (m)	volume (ha/m)	BottomDraw (cms)	DI (cms)	Orifice Tube (cms)	Overflow Weir (cms)	TOTAL FLOW (cms)	DATA POINTS for Otthymo
	0.00	269.70	0.0000	0.000				0.000	1
	0.05	269.75	0.0277	0.000				0.000	
	0.10	269.80	0.0560	0.000				0.000	
	0.15	269.85	0.0847	0.020				0.020	
	0.20	269.90	0.1140	0.028				0.028	
	0.25	269.95	0.1438	0.034				0.034	2
	0.30	270.00	0.1741	0.039				0.039	
	0.35	270.05	0.2049	0.044				0.044	
	0.40	270.10	0.2364	0.048				0.048	
	0.45	270.15	0.2683	0.052				0.052	
	0.50	270.20	0.3009	0.055				0.055	3
	0.55	270.25	0.3340	0.059				0.059	
Top of Ext Det	0.60	270.30	0.3678	0.062	0.000	0.079		0.062	
	0.65	270.35	0.4021	0.065	0.015	0.083		0.080	
Orifice 1 + DI	0.70	270.40	0.4370	0.068	0.039	0.086		0.086	4
CB Orifice Tube	0.75	270.45	0.4726	0.071	0.084	0.090		0.090	5
	0.80	270.50	0.5088	0.073	0.120	0.093		0.093	
	0.85	270.55	0.5456	0.076	0.180	0.096		0.096	
	0.90	270.60	0.5830	0.078	0.252	0.100		0.100	
	0.95	270.65	0.6211	0.081	0.330	0.103		0.103	
	1.00	270.70	0.6599	0.083	0.420	0.106		0.106	
	1.05	270.75	0.6994	0.085	0.540	0.109		0.109	
	1.10	270.80	0.7395	0.088	0.720	0.111		0.111	
	1.15	270.85	0.7803	0.090		0.114		0.090	
	1.20	270.90	0.8218	0.092		0.117		0.092	
	1.25	270.95	0.8641	0.094		0.119		0.119	
Control Weir	1.30	271.00	0.9070	0.096		0.122		0.122	6
	1.35	271.05	0.9507	0.098		0.124		0.124	
	1.40	271.10	0.9951	0.100		0.127		0.127	
	1.45	271.15	1.0402	0.102		0.129		0.129	
	1.50	271.20	1.0861	0.104		0.132		0.132	
	1.55	271.25	1.1328	0.106		0.134		0.134	
	1.60	271.30	1.1803	0.107		0.136		0.136	7
	1.65	271.35	1.2285	0.109		0.139		0.139	
	1.70	271.40	1.2775	0.111		0.141		0.141	
	1.75	271.45	1.3273	0.113		0.143		0.143	
	1.80	271.50	1.3779	0.114		0.145		0.145	
	1.85	271.55	1.4294	0.116		0.147		0.147	
	1.90	271.60	1.4816	0.118		0.149		0.149	
	1.95	271.65	1.5348	0.119		0.151		0.151	
Top of Spillway	2.00	271.70	1.5887	0.121		0.153	0.000	0.153	8
	2.05	271.75	1.6435	0.122		0.155	0.467	0.622	
	2.10	271.80	1.6992	0.124		0.157	1.320	1.478	
	2.15	271.85	1.7557	0.126		0.159	2.425	2.585	9
	2.20	271.90	1.8131	0.127		0.161	3.734	3.896	
	2.25	271.95	1.8714	0.129		0.163	5.219	5.382	
	2.30	272.00	1.9306	0.130		0.165	6.860	7.025	
	2.35	272.05	1.9908	0.132		0.167	8.645	8.812	
	2.40	272.10	2.0518	0.133		0.169	10.562	10.731	10

COLE ENGINEERING

Stage - Storage - Discharge Curve
Pond 6
L09-301
November 20, 2013

		c	diam / length	control elev	inv	
	BottomDraw	0.63	0.270	265.235	265.10	
	Ditch Inlet (MTO Chart 4.20)			265.900		1.2 m W Ditch Inlet CB (2:1 grate slope)
	CB orifice tube	0.80	0.750	265.475	265.10	
	Weir / Channel	1.67	15.000	267.150		15m base with 4% sideslopes

	depth (m)	elev (m)	volume (ha/m)	BottomDraw (cms)	DI (cms)	Orifice Tube (cms)	Overflow Weir (cms)	TOTAL FLOW (cms)	DATA POINTS for Otthymo
	0.00	265.10	0.0000	0.000				0.000	1
	0.05	265.15	0.0400	0.000				0.000	
	0.10	265.20	0.0804	0.000				0.000	
	0.15	265.25	0.1212	0.020				0.020	
	0.20	265.30	0.1625	0.041				0.041	2
	0.25	265.35	0.2042	0.054				0.054	
	0.30	265.40	0.2464	0.065				0.065	
	0.35	265.45	0.2890	0.074				0.074	
	0.40	265.50	0.3321	0.082				0.082	
	0.45	265.55	0.3757	0.090				0.090	
	0.50	265.60	0.4197	0.097				0.097	3
	0.55	265.65	0.4642	0.103				0.103	
	0.60	265.70	0.5091	0.109				0.109	
	0.65	265.75	0.5546	0.115				0.115	
	0.70	265.80	0.6005	0.120				0.120	
Top of Ext Det	0.75	265.85	0.6470	0.125	0.000	0.959		0.125	
	0.80	265.90	0.6939	0.130	0.030	1.021		0.160	4
	0.85	265.95	0.7413	0.135	0.078	1.079		0.213	
	0.90	266.00	0.7893	0.140	0.168	1.134		0.308	
	0.95	266.05	0.8377	0.144	0.240	1.187		0.384	
Orifice 1 + DI	1.00	266.10	0.8867	0.149	0.360	1.238		0.509	5
CB Orifice Tube	1.05	266.15	0.9362	0.153	0.504	1.286		0.657	6
	1.10	266.20	0.9863	0.157	0.660	1.333		0.817	
	1.15	266.25	1.0368	0.161	0.840	1.378		1.001	7
	1.20	266.30	1.0879	0.165	1.080	1.422		1.245	
	1.25	266.35	1.1396	0.169	1.440	1.464		1.464	8
	1.30	266.40	1.1918	0.172		1.506		0.172	
	1.35	266.45	1.2445	0.176		1.546		1.546	
	1.40	266.50	1.2979	0.180		1.585		1.585	
	1.45	266.55	1.3517	0.183		1.623		1.623	9
	1.50	266.60	1.4062	0.187		1.660		1.660	
	1.55	266.65	1.4612	0.190		1.697		1.697	
	1.60	266.70	1.5168	0.193		1.733		1.733	
	1.65	266.75	1.5730	0.197		1.768		1.768	
	1.70	266.80	1.6298	0.200		1.802		1.802	
	1.75	266.85	1.6871	0.203		1.836		1.836	
	1.80	266.90	1.7451	0.206		1.869		1.869	
	1.85	266.95	1.8037	0.209		1.901		1.901	
	1.90	267.00	1.8629	0.212		1.933		1.933	
	1.95	267.05	1.9226	0.215		1.965		1.965	
100yr	2.00	267.10	1.9831	0.218		1.996		1.996	
Top of Spillway	2.05	267.15	2.0441	0.221		2.026	0.000	2.026	10
	2.10	267.20	2.1058	0.224		2.056	0.286	2.342	
	2.15	267.25	2.1681	0.227		2.086	0.824	2.910	
	2.20	267.30	2.2310	0.230		2.115	1.543	3.657	11
	2.25	267.35	2.2946	0.232		2.144	2.420	4.563	
	2.30	267.40	2.3589	0.235		2.172	3.444	5.616	
	2.35	267.45	2.4238	0.238		2.200	4.610	6.810	
	2.40	267.50	2.4893	0.240		2.228	5.913	8.141	
	2.45	267.55	2.5555	0.243		2.255	7.351	9.606	
	2.50	267.60	2.6224	0.246		2.282	8.923	11.205	12

COLE ENGINEERING

Stage - Storage - Discharge Curve
Pond 8
L09-301
November 20, 2013

		c	diam / length	control elev	inv				
	BottomDraw	0.63	0.160	269.980	269.90				
	Ditch Inlet (MTO Chart 4.20)			271.150		1.2 m W Ditch Inlet CB (2:1 grate slope)			
	CB pipe	0.80	0.525	270.163	269.90				
	Weir / Channel	1.67	12.000	272.550		5m base with 6cm width increase per 1cm in flow depth			

.

	depth (m)	elev (m)	volume (ha/m)	BottomDraw (cms)	DI (cms)	Orifice Tube (cms)	Overflow Weir (cms)	TOTAL FLOW (cms)	DATA POINTS for Otthymo
	0.00	269.90	0.0000	0.000				0.000	1
	0.05	269.95	0.0180	0.000				0.000	
	0.10	270.00	0.0362	0.000				0.000	
	0.15	270.05	0.0547	0.015				0.015	
	0.20	270.10	0.0734	0.019				0.019	2
	0.25	270.15	0.0924	0.023				0.023	
	0.30	270.20	0.1116	0.026				0.026	
	0.35	270.25	0.1311	0.029				0.029	
	0.40	270.30	0.1509	0.032				0.032	
	0.45	270.35	0.1710	0.034				0.034	
	0.50	270.40	0.1913	0.036				0.036	3
	0.55	270.45	0.2120	0.038				0.038	
	0.60	270.50	0.2329	0.040				0.040	
	0.65	270.55	0.2541	0.042				0.042	
	0.70	270.60	0.2757	0.044				0.044	
Top of Ext Det	0.75	270.65	0.2976	0.046	0.000	0.536		0.046	4
	0.80	270.70	0.3198	0.048	0.030	0.562		0.078	
	0.85	270.75	0.3424	0.049	0.078	0.588		0.127	
	0.90	270.80	0.3652	0.051	0.168	0.612		0.219	
	0.95	270.85	0.3885	0.052	0.240	0.636		0.292	
	1.00	270.90	0.4121	0.054	0.360	0.659		0.414	
Orifice 1 + DI	1.05	270.95	0.4360	0.055	0.504	0.681		0.559	5
Orifice Tube	1.10	271.00	0.4603	0.057	0.660	0.702		0.702	6
	1.15	271.05	0.4850	0.058	0.840	0.723		0.723	
	1.20	271.10	0.5101	0.059	1.080	0.743		0.743	
	1.25	271.15	0.5356	0.061	1.440	0.762		0.762	
	1.30	271.20	0.5614	0.062		0.781		0.781	
	1.35	271.25	0.5877	0.063		0.800		0.800	
	1.40	271.30	0.6143	0.064		0.818		0.818	
	1.45	271.35	0.6414	0.066		0.836		0.836	
	1.50	271.40	0.6689	0.067		0.853		0.853	
	1.55	271.45	0.6968	0.068		0.870		0.870	
	1.60	271.50	0.7252	0.069		0.887		0.887	
	1.65	271.55	0.7540	0.070		0.904		0.904	
	1.70	271.60	0.7832	0.071		0.920		0.920	
	1.75	271.65	0.8130	0.073		0.936		0.936	
	1.80	271.70	0.8431	0.074		0.951		0.951	
	1.85	271.75	0.8737	0.075		0.967		0.967	
	1.90	271.80	0.9049	0.076		0.982		0.982	
	1.95	271.85	0.9364	0.077		0.996		0.996	
100-Year El.	2.00	271.90	0.9685	0.078		1.011	0.000	1.011	7
	2.05	271.95	1.0011	0.079		1.026	0.000	1.026	8
	2.10	272.00	1.0342	0.080		1.040	0.000	1.040	
	2.15	272.05	1.0677	0.081		1.054	0.000	1.054	
	2.20	272.10	1.1018	0.082		1.068	0.000	1.068	
	2.25	272.15	1.1364	0.083		1.081	0.000	1.081	
	2.30	272.20	1.1716	0.084		1.095	0.000	1.095	
	2.35	272.25	1.2073	0.085		1.108	0.000	1.108	
	2.40	272.30	1.2435	0.085		1.122	0.000	1.122	9
	2.45	272.35	1.2802	0.086		1.135	0.000	1.135	
	2.50	272.40	1.3175	0.087		1.147	0.000	1.147	

COLE ENGINEERING

Stage - Storage - Discharge Curve
Pond 9
L09-301
November 20, 2013

		c	diam / length	control elev	inv				
	BottomDraw	0.63	0.200	264.550	264.45				
	Ditch Inlet (MTO Chart 4.20)			264.850		1.2 m W Ditch Inlet CB (2:1 grate slope)			
	CB orifice plate	0.63	0.505	264.703	264.45				
	Weir / Channel	1.67	6.000	267.850		6m base with 8% sideslopes			

	depth (m)	elev (m)	volume (ha/m)	BottomDraw (cms)	DI (cms)	Orifice Plate (cms)	Overflow Weir (cms)	TOTAL FLOW (cms)	DATA POINTS for Otthymo
	0.00	264.45	0.0000	0.000				0.000	1
	0.05	264.50	0.0303	0.000				0.000	
	0.10	264.55	0.0609	0.000				0.000	
	0.15	264.60	0.0920	0.020				0.020	2
	0.20	264.65	0.1234	0.028				0.028	
	0.25	264.70	0.1552	0.034				0.034	
	0.30	264.75	0.1874	0.039				0.039	
	0.35	264.80	0.2199	0.044				0.044	
Top of Ext Det	0.40	264.85	0.2529	0.048	0.000	0.215		0.048	3
= 264.87	0.45	264.90	0.2863	0.052	0.030	0.248		0.082	
	0.50	264.95	0.3201	0.055	0.078	0.278		0.133	
	0.55	265.00	0.3543	0.059	0.168	0.305		0.227	
	0.60	265.05	0.3889	0.062	0.240	0.329		0.302	4
Orifice 1 + DI	0.65	265.10	0.4239	0.065	0.360	0.352		0.352	5
CB Orifice Tube	0.70	265.15	0.4593	0.068	0.504	0.374		0.374	
	0.75	265.20	0.4952	0.071	0.660	0.394		0.394	
	0.80	265.25	0.5314	0.073	0.840	0.414		0.414	
	0.85	265.30	0.5681	0.076	1.080	0.432		0.432	
	0.90	265.35	0.6053	0.078	1.440	0.450		0.450	
	0.95	265.40	0.6428	0.081		0.467		0.467	
	1.00	265.45	0.6808	0.083		0.483		0.483	
	1.05	265.50	0.7193	0.085		0.499		0.499	
	1.10	265.55	0.7581	0.088		0.515		0.515	
	1.15	265.60	0.7975	0.090		0.530		0.530	
	1.20	265.65	0.8372	0.092		0.544		0.544	
	1.25	265.70	0.8775	0.094		0.558		0.558	
	1.30	265.75	0.9182	0.096		0.572		0.572	
	1.35	265.80	0.9593	0.098		0.586		0.586	
	1.40	265.85	1.0009	0.100		0.599		0.599	
	1.45	265.90	1.0430	0.102		0.612		0.612	
	1.50	265.95	1.0855	0.104		0.624		0.624	
	1.55	266.00	1.1285	0.106		0.637		0.637	
	1.60	266.05	1.1720	0.107		0.649		0.649	
	1.65	266.10	1.2160	0.109		0.661		0.661	
	1.70	266.15	1.2605	0.111		0.672		0.672	
	1.75	266.20	1.3054	0.113		0.684		0.684	
	1.80	266.25	1.3508	0.114		0.695		0.695	
	1.85	266.30	1.3968	0.116		0.706		0.706	
	1.90	266.35	1.4432	0.118		0.717		0.717	
	1.95	266.40	1.4901	0.119		0.728		0.728	
100-Year WS	2.00	266.45	1.5375	0.121		0.739		0.739	6
	2.05	266.50	1.5855	0.122		0.749		0.749	
	2.10	266.55	1.6339	0.124		0.760		0.760	
	2.15	266.60	1.6828	0.126		0.770		0.770	
	2.20	266.65	1.7323	0.127		0.780		0.780	
	2.25	266.70	1.7823	0.129		0.790		0.790	
	2.30	266.75	1.8328	0.130		0.800		0.800	
	2.35	266.80	1.8838	0.132		0.809		0.809	
	2.40	266.85	1.9354	0.133		0.819		0.819	7
	2.45	266.90	1.9875	0.134		0.829		0.829	
	2.50	266.95	2.0401	0.136		0.838		0.838	
	2.55	267.00	2.0933	0.137		0.847		0.847	
	2.60	267.05	2.1470	0.139		0.856		0.856	
	2.65	267.10	2.2013	0.140		0.865		0.865	
	2.70	267.15	2.2561	0.141		0.874		0.874	
	2.75	267.20	2.3114	0.143		0.883		0.883	
	2.80	267.25	2.3674	0.144		0.892		0.892	
	2.85	267.30	2.4238	0.145		0.901		0.901	
	2.90	267.35	2.4809	0.147		0.909		0.909	
	2.95	267.40	2.5385	0.148		0.918		0.918	
	3.00	267.45	2.5967	0.149		0.926		0.926	10
	3.05	267.50	2.6554	0.151		0.935		0.935	
	3.10	267.55	2.7147	0.152		0.943		0.943	
	3.15	267.60	2.7746	0.153		0.951		0.951	
	3.20	267.65	2.8351	0.154		0.960		0.960	
	3.25	267.70	2.8962	0.156		0.968		0.968	
	3.30	267.75	2.9578	0.157		0.976		0.976	
	3.35	267.80	3.0201	0.158		0.984	0.000	0.984	
Top of Spillway	3.40	267.85	3.0829	0.159		0.992	0.000	0.992	11
	3.45	267.90	3.1464	0.160		0.999	0.118	1.117	
	3.50	267.95	3.2104	0.162		1.007	0.349	1.356	
	3.55	268.00	3.2751	0.163		1.015	0.669	1.684	
	3.60	268.05	3.3403	0.164		1.023	1.075	2.098	
	3.65	268.10	3.4062	0.165		1.030	1.566	2.596	12
	3.70	268.15	3.4727	0.166		1.038	2.140	3.178	
	3.75	268.20	3.5398	0.167		1.045	2.801	3.846	
	3.80	268.25	3.6075	0.169		1.053	3.549	4.602	

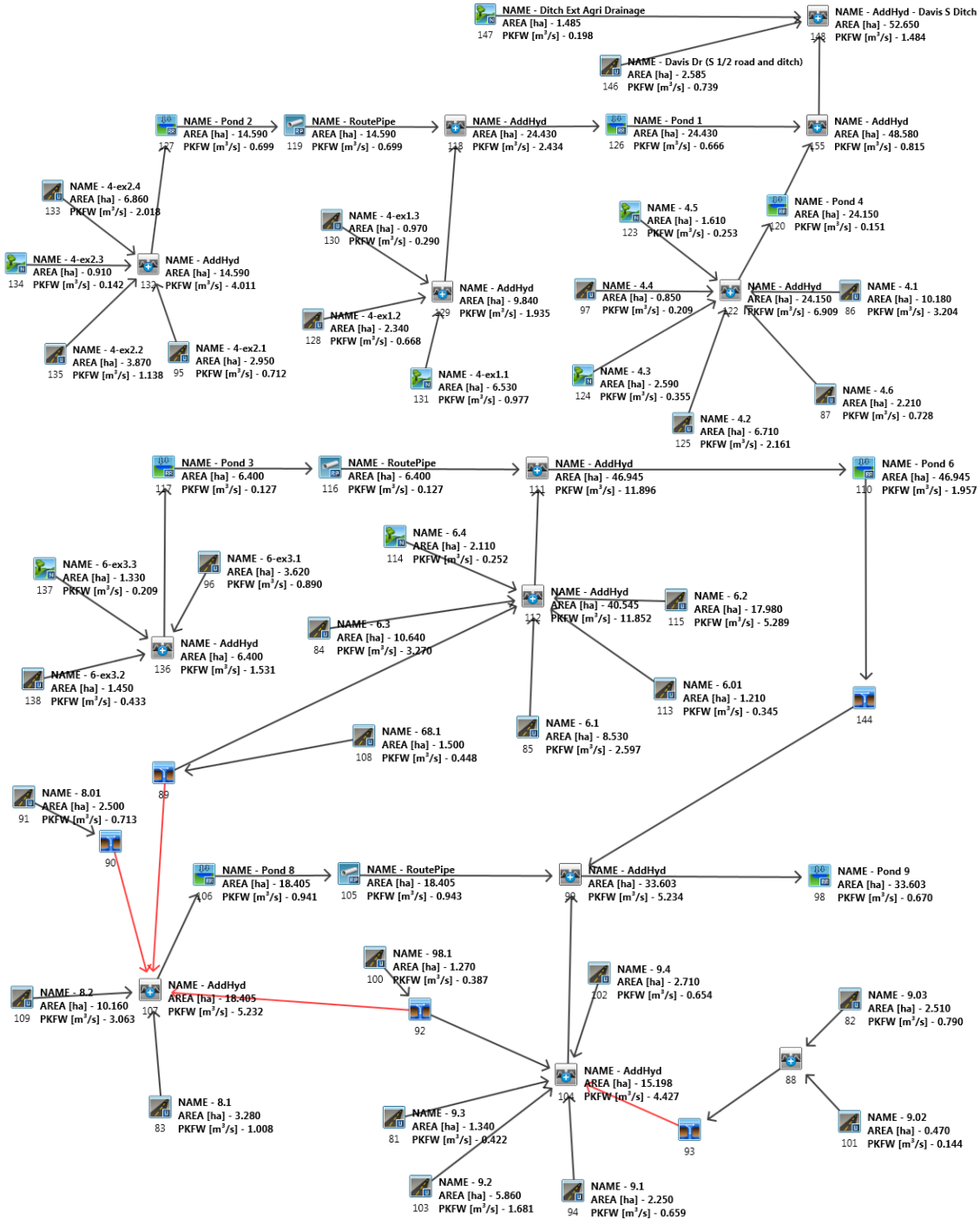
APPENDIX G
Post-Development Hydrologic Model Output

COLE ENGINEERING

Experience Enhancing Excellence

L09-301
Glenway golf course development, Newmarket, ON
24 Hour SCS Storm Post-Development Model Schematic
November 2013

VO2 Model Schematic



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       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O    Company
        OOO     T      T    H   H    Y    M   M   OOO                Serial

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                    *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual Otthymo 3.0\VO2\voin.dat
  Output  filename: C:\Users\DMcBrayne\AppData\Local\Temp\99de1fdc-d6ae-4e6e-b844-
585c8b2021ad\Scenario.out
  Summary filename: C:\Users\DMcBrayne\AppData\Local\Temp\99de1fdc-d6ae-4e6e-b844-
585c8b2021ad\Scenario.sum


DATE: 11/20/2013                          TIME: 09:02:43

USER:


COMMENTS: _____________________________________________________


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  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************


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|    READ STORM   |      Filename: C:\Users\DMcBrayne\AppD
|                 |                ata\Local\Temp\
|                 |                99de1fdc-d6ae-4e6e-b844-585c8b2021ad\44ae5d35
| Ptotal= 52.12 mm |    Comments: TWO YEAR SCS STORM  WITH A TWELVE MINUTE
-------------------
                TIME    RAIN |  TIME    RAIN | '  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr | '   hrs   mm/hr |   hrs   mm/hr
               0.20    0.51 |  6.20    1.02 | 12.20   10.67 | 18.20    0.76
               0.40    0.51 |  6.40    1.02 | 12.40    6.60 | 18.40    0.76
               0.60    0.51 |  6.60    1.02 | 12.60    4.83 | 18.60    0.76
               0.80    0.51 |  6.80    1.02 | 12.80    4.57 | 18.80    0.76
               1.00    0.51 |  7.00    1.02 | 13.00    3.30 | 19.00    0.76
               1.20    0.51 |  7.20    1.02 | 13.20    2.79 | 19.20    0.76
               1.40    0.51 |  7.40    1.02 | 13.40    2.79 | 19.40    0.76
               1.60    0.51 |  7.60    1.02 | 13.60    2.79 | 19.60    0.76
               1.80    0.51 |  7.80    1.02 | 13.80    2.79 | 19.80    0.76
               2.00    0.51 |  8.00    1.02 | 14.00    2.79 | 20.00    0.76
               2.20    0.51 |  8.20    1.52 | 14.20    1.52 | 20.20    0.51
               2.40    0.51 |  8.40    1.52 | 14.40    1.52 | 20.40    0.51
               2.60    0.51 |  8.60    1.52 | 14.60    1.52 | 20.60    0.51
               2.80    0.51 |  8.80    1.52 | 14.80    1.52 | 20.80    0.51
               3.00    0.51 |  9.00    1.52 | 15.00    1.52 | 21.00    0.51
               3.20    0.51 |  9.20    1.52 | 15.20    1.52 | 21.20    0.51
               3.40    0.51 |  9.40    1.52 | 15.40    1.52 | 21.40    0.51
               3.60    0.51 |  9.60    1.52 | 15.60    1.52 | 21.60    0.51
               3.80    0.51 |  9.80    1.52 | 15.80    1.52 | 21.80    0.51
               4.00    0.51 | 10.00    1.52 | 16.00    1.52 | 22.00    0.51
               4.20    1.02 | 10.20    3.05 | 16.20    1.02 | 22.20    0.51
               4.40    1.02 | 10.40    3.05 | 16.40    1.02 | 22.40    0.51
               4.60    1.02 | 10.60    3.05 | 16.60    1.02 | 22.60    0.51
               4.80    1.02 | 10.80    3.05 | 16.80    1.02 | 22.80    0.51
               5.00    1.02 | 11.00    3.05 | 17.00    1.02 | 23.00    0.51
               5.20    1.02 | 11.20    4.06 | 17.20    1.02 | 23.20    0.51
               5.40    1.02 | 11.40    5.84 | 17.40    1.02 | 23.40    0.51
               5.60    1.02 | 11.60   13.21 | 17.60    1.02 | 23.60    0.51
               5.80    1.02 | 11.80   28.96 | 17.80    1.02 | 23.80    0.51
               6.00    1.02 | 12.00   60.45 | 18.00    1.02 | 24.00    0.51

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| CALIB           |
| NASHYD   (0114) |   Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min|   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.070 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  15.966
     TOTAL RAINFALL   (mm)=  52.121
     RUNOFF COEFFICIENT   =   0.306

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB           |
| STANDHYD  (0084)|   Area     (ha)=  10.64
|ID= 1 DT=12.0 min|   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       7.45          3.19
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      60.45         24.82
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.25          0.18          1.427 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      51.12         18.32          41.28
     TOTAL RAINFALL   (mm)=      52.12         52.12          52.12
     RUNOFF COEFFICIENT   =       0.98          0.35           0.79

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0085)|   Area     (ha)=   8.53
|ID= 1 DT=12.0 min|   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.80          2.73
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      60.45         24.82
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.97          0.15          1.125 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      51.12         18.32          40.62
     TOTAL RAINFALL   (mm)=      52.12         52.12          52.12
     RUNOFF COEFFICIENT   =       0.98          0.35           0.78

***** 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.

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| CALIB           |
| STANDHYD  (0108)|   Area     (ha)=   1.50
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|ID= 1 DT=12.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.96	0.54
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	60.45	24.82
over (min)	12.00	12.00
Storage Coeff. (min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

	TOTALS
PEAK FLOW (cms)=	0.16 0.03 0.191 (iii)
TIME TO PEAK (hrs)=	12.00 12.00 12.00
RUNOFF VOLUME (mm)=	51.12 18.32 39.31
TOTAL RAINFALL (mm)=	52.12 52.12 52.12
RUNOFF COEFFICIENT =	0.98 0.35 0.75

***** 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.

DUHYD (0089)		AREA	QPEAK	TPEAK	R.V.
Inlet Cap.=0.350		(ha)	(cms)	(hrs)	(mm)
#of Inlets= 1	TOTAL HYD.(ID= 1):	1.50	0.19	12.00	39.31
Total(cms)= 0.3	MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
	MINOR SYS.(ID= 3):	1.50	0.19	12.00	39.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0113)	Area (ha)= 1.21
ID= 1 DT=12.0 min	Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.67	0.54
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	60.45	24.82
over (min)	12.00	12.00
Storage Coeff. (min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

	TOTALS
PEAK FLOW (cms)=	0.11 0.03 0.142 (iii)
TIME TO PEAK (hrs)=	12.00 12.00 12.00
RUNOFF VOLUME (mm)=	51.12 18.32 36.36
TOTAL RAINFALL (mm)=	52.12 52.12 52.12
RUNOFF COEFFICIENT =	0.98 0.35 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.

CALIB STANDHYD (0115)	Area (ha)= 17.98
ID= 1 DT=12.0 min	Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	10.97	7.01
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	60.45	24.82
over (min)	12.00	12.00
Storage Coeff. (min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.10

	TOTALS
PEAK FLOW (cms)=	1.84 0.39 2.230 (iii)
TIME TO PEAK (hrs)=	12.00 12.00 12.00
RUNOFF VOLUME (mm)=	51.12 18.32 38.33
TOTAL RAINFALL (mm)=	52.12 52.12 52.12
RUNOFF COEFFICIENT =	0.98 0.35 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 (0112) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0113):	1.21	0.142	12.00	36.36
+ ID2= 2 (0114):	2.11	0.070	12.00	15.97
ID = 3 (0112):	3.32	0.212	12.00	23.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	3.32	0.212	12.00	23.40
+ ID2= 2 (0115):	17.98	2.230	12.00	38.33
ID = 1 (0112):	21.30	2.442	12.00	36.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	21.30	2.442	12.00	36.00
+ ID2= 2 (0084):	10.64	1.427	12.00	41.28
ID = 3 (0112):	31.94	3.869	12.00	37.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	31.94	3.869	12.00	37.76
+ ID2= 2 (0085):	8.53	1.125	12.00	40.62
ID = 1 (0112):	40.47	4.994	12.00	38.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

*** W A R N I N G : HYDROGRAPH 0089 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001

ID1= 1 (0112):	40.47	4.994	12.00	38.36
+ ID2= 2 (0089):	0.00	0.000	0.00	0.00

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          ================================================
          ID = 3 (0112):    40.47   4.994    12.00    38.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB           |
| NASHYD    (0137)|   Area     (ha)=   1.33   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min|   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.391

     PEAK FLOW       (cms)=   0.060 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  13.177
     TOTAL RAINFALL   (mm)=  52.121
     RUNOFF COEFFICIENT   =   0.253

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0096)|   Area     (ha)=   3.62
|ID= 1 DT=12.0 min|   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     1.01         2.61
     Dep. Storage     (mm)=     1.00         1.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=    30.00        20.00
     Mannings n            =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    60.45        24.82
                  over (min)    12.00        12.00
     Storage Coeff.  (min)=     1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=    12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.17         0.14         0.315 (iii)
     TIME TO PEAK    (hrs)=    12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    51.12        18.32        27.50
     TOTAL RAINFALL   (mm)=    52.12        52.12        52.12
     RUNOFF COEFFICIENT   =     0.98         0.35         0.53

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0138)|   Area     (ha)=   1.45
|ID= 1 DT=12.0 min|   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     0.93         0.52
     Dep. Storage     (mm)=     1.00         1.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=    30.00        20.00
     Mannings n            =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=    60.45        24.82
                  over (min)    12.00        12.00
     Storage Coeff.  (min)=     1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=    12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.16         0.03         0.185 (iii)
     TIME TO PEAK    (hrs)=    12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    51.12        18.32        39.31
     TOTAL RAINFALL   (mm)=    52.12        52.12        52.12
     RUNOFF COEFFICIENT   =     0.98         0.35         0.75

***** 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.

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-------------------
| ADD HYD   (0136)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK      R.V.
-------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0137):     1.33   0.060    12.00     13.18
        + ID2= 2 (0138):     1.45   0.185    12.00     39.31
          ================================================
          ID = 3 (0136):     2.78   0.244    12.00     26.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0136)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK      R.V.
-------------------          (ha)    (cms)    (hrs)      (mm)
          ID1= 3 (0136):     2.78   0.244    12.00     26.81
        + ID2= 2 (0096):     3.62   0.315    12.00     27.50
          ================================================
          ID = 1 (0136):     6.40   0.559    12.00     27.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0117)|
| IN= 2---> OUT= 1|
| DT=  5.0 min    |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.3260     0.8017
                         0.0790     0.1850    |   0.3960     0.9004
                         0.2270     0.3947    |   0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0136)    6.400     0.559     12.00      27.20
     OUTFLOW: ID= 1 (0117)    6.400     0.041     13.00      27.11

               PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.42
               TIME SHIFT OF PEAK FLOW          (min)= 60.00
               MAXIMUM  STORAGE   USED        (ha.m.)=  0.0972

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| ROUTE PIPE (0116)|    PIPE Number      =   1.00
| IN= 2---> OUT= 1 |    Diameter    (mm)=1650.00
| DT=  5.0 min     |    Length       (m)= 850.00
-------------------     Slope      (m/m)=  0.005
                        Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE     VELOCITY     TRAV.TIME
         (m)     (cu.m.)       (cms)         (m/s)         min
        0.09    .367E+02        0.0          0.80         17.68
        0.17    .102E+03        0.1          1.25         11.33
        0.26    .184E+03        0.3          1.61          8.81
        0.35    .278E+03        0.6          1.91          7.41
        0.43    .382E+03        1.0          2.18          6.51
        0.52    .492E+03        1.4          2.41          5.88
        0.61    .608E+03        1.9          2.61          5.43
        0.69    .727E+03        2.4          2.79          5.08
        0.78    .848E+03        2.9          2.95          4.81
        0.87    .970E+03        3.5          3.08          4.60
        0.96    .109E+04        4.1          3.20          4.43
        1.04    .121E+04        4.7          3.29          4.31
        1.13    .133E+04        5.2          3.36          4.22
        1.22    .144E+04        5.8          3.41          4.15
        1.30    .154E+04        6.2          3.44          4.12
        1.39    .163E+04        6.6          3.43          4.13
        1.48    .172E+04        6.9          3.40          4.17
        1.56    .178E+04        6.9          3.31          4.28
        1.65    .182E+04        6.5          3.02          4.70
                                <---- hydrograph ---->   <-pipe / channel->
                             AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)    (cms)    (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0117)   6.40     0.04    13.00  27.11      0.09      0.82
     OUTFLOW: ID= 1 (0116)   6.40     0.04    13.50  27.10      0.09      0.82

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| ADD HYD   (0111) |
|   1 +  2 =  3    |
-------------------          AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0112):    40.47   4.994    12.00    38.36
        + ID2= 2 (0116):     6.40   0.041    13.50    27.10
          ================================================
          ID = 3 (0111):    46.87   5.010    12.00    36.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0110) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |       OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------         (cms)     (ha.m.)    |   (cms)     (ha.m.)
                            0.0000     0.0000    |  1.0010      1.0368
                            0.0410     0.1625    |  1.4640      1.1396
                            0.0970     0.4197    |  1.6230      1.3517
                            0.1600     0.6939    |  2.0260      2.0441
                            0.5090     0.8867    |  2.6870      2.2310
                            0.6570     0.9362    |  6.1640      2.6224

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0111)     46.870     5.010     12.00      36.84
     OUTFLOW: ID= 1 (0110)     46.870     0.584     12.50      36.82

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.66
                    TIME SHIFT OF PEAK FLOW          (min)= 30.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.9124

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-------------------
| DUHYD     (0144) |
| Inlet Cap.=2.787 |
| #of Inlets=    1 |
| Total(cms)=  2.8 |       AREA     QPEAK     TPEAK    R.V.
-------------------         (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):  46.87      0.58     12.50   36.82
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):  46.87      0.58     12.50   36.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB             |
| STANDHYD  (0081)  |    Area    (ha)=   1.34
|ID= 1 DT=12.0 min  |    Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.00          0.34
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      60.45         24.82
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.17          0.02          0.187 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      51.12         18.32          42.92
     TOTAL RAINFALL   (mm)=      52.12         52.12          52.12
     RUNOFF COEFFICIENT   =       0.98          0.35           0.82

***** 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.

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-------------------
| CALIB             |
| STANDHYD  (0082)  |    Area    (ha)=   2.51
|ID= 1 DT=12.0 min  |    Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.88          0.63
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      60.45         24.82
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.32          0.03          0.351 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      51.12         18.32          42.92
     TOTAL RAINFALL   (mm)=      52.12         52.12          52.12
     RUNOFF COEFFICIENT   =       0.98          0.35           0.82

***** 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.

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-------------------
| CALIB             |
| STANDHYD  (0101)  |    Area    (ha)=   0.47
|ID= 1 DT=12.0 min  |    Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.33          0.14
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      60.45         24.82
               over (min)        12.00         12.00
     Storage Coeff.  (min)=       1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00         12.00
     Unit Hyd. peak  (cms)=       0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06          0.01          0.063 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      51.12         18.32          41.27
     TOTAL RAINFALL   (mm)=      52.12         52.12          52.12
     RUNOFF COEFFICIENT   =       0.98          0.35           0.79

***** 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   (0088) |
|   1 +  2 =  3    |
-------------------          AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0101):      0.47   0.063    12.00    41.27
        + ID2= 2 (0082):      2.51   0.351    12.00    42.92
          ================================================
          ID = 3 (0088):      2.98   0.414    12.00    42.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| DUHYD     (0093) |
| Inlet Cap.=0.934 |
| #of Inlets=    1 |
| Total(cms)=  0.9 |       AREA     QPEAK     TPEAK    R.V.
-------------------         (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.98      0.41     12.00   42.66
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   2.98      0.41     12.00   42.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
| CALIB                |   Area    (ha)=   2.25
| STANDHYD  (0094)     |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
| ID= 1 DT=12.0 min    |
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.35	0.90
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	60.45	24.82
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	0.23	0.05	0.277 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.12	18.32	38.00
TOTAL RAINFALL	(mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT	=	0.98	0.35	0.73

***** 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                |   Area    (ha)=   1.27
| STANDHYD  (0100)     |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
| ID= 1 DT=12.0 min    |
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.86	0.41
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	60.45	24.82
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	0.15	0.02	0.168 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.12	18.32	40.62
TOTAL RAINFALL	(mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT	=	0.98	0.35	0.78

***** 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.

```
| DUHYD     (0092)     |
| Inlet Cap.=0.309     |
| #of Inlets=    1     |
| Total(cms)=  0.3     |
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.17	12.00	40.62
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.27	0.17	12.00	40.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| CALIB                |   Area    (ha)=   2.71
| STANDHYD  (0102)     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
| ID= 1 DT=12.0 min    |
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	60.45	24.82
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	0.11	0.11	0.226 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.12	18.32	26.52
TOTAL RAINFALL	(mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT	=	0.98	0.35	0.51

***** 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                |   Area    (ha)=   5.86
| STANDHYD  (0103)     |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
| ID= 1 DT=12.0 min    |
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.28	2.58
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	60.45	24.82
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.23 (ii)	9.36 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.10

		TOTALS
PEAK FLOW	(cms)=	0.55	0.14	0.694 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	51.12	18.32	36.69
TOTAL RAINFALL	(mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT	=	0.98	0.35	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   (0104)     |
|   1 +  2 =  3        |
```

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):		2.71	0.226	12.00	26.52
+ ID2= 2 (0103):		5.86	0.694	12.00	36.69
ID = 3 (0104):		8.57	0.920	12.00	33.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD   (0104)     |
|   3 +  2 =  1        |
```

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0104):		8.57	0.920	12.00	33.47
+ ID2= 2 (0081):		1.34	0.187	12.00	42.92
ID = 1 (0104):		9.91	1.107	12.00	34.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0092 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
         ID1= 1 (0104):     9.91   1.107    12.00    34.75
       + ID2= 2 (0092):     0.00   0.000     0.00     0.00
         ================================================
         ID = 3 (0104):     9.91   1.107    12.00    34.75

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0104) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0104):     9.91   1.107    12.00    34.75
       + ID2= 2 (0093):     2.98   0.414    12.00    42.66
         ================================================
         ID = 1 (0104):    12.89   1.521    12.00    36.58

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0104):    12.89   1.521    12.00    36.58
       + ID2= 2 (0094):     2.25   0.277    12.00    38.00
         ================================================
         ID = 3 (0104):    15.14   1.798    12.00    36.79

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD  (0083) |   Area    (ha)=   3.28
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.30         0.98
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     60.45        24.82
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.39         0.05          0.440 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     51.12        18.32          41.28
     TOTAL RAINFALL   (mm)=     52.12        52.12          52.12
     RUNOFF COEFFICIENT   =      0.98         0.35           0.79

***** 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  (0091) |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.38         1.12
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     60.45        24.82
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.23         0.06          0.293 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     51.12        18.32          36.36
     TOTAL RAINFALL   (mm)=     52.12        52.12          52.12
     RUNOFF COEFFICIENT   =      0.98         0.35           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.

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-------------------
| DUHYD     (0090) |
| Inlet Cap.=0.502 |
| #of Inlets=    1 |
| Total(cms)=  0.5 |          AREA     QPEAK     TPEAK    R.V.
-------------------          (ha)      (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):     2.50      0.29     12.00   36.36
     ================================================
     MAJOR SYS.(ID= 2):     0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):     2.50      0.29     12.00   36.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0109) |   Area    (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      6.71         3.45
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     60.45        24.82
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.13         0.19          1.317 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     51.12        18.32          39.97
     TOTAL RAINFALL   (mm)=     52.12        52.12          52.12
     RUNOFF COEFFICIENT   =      0.98         0.35           0.77

***** 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.

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-------------------
| ADD HYD   (0107) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0109):    10.16   1.317    12.00    39.97
       + ID2= 2 (0083):     3.28   0.440    12.00    41.28
         ================================================
         ID = 3 (0107):    13.44   1.757    12.00    40.29

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	13.44	1.757	12.00	40.29
	+ ID2= 2 (0089):	1.50	0.191	12.00	39.31
	ID = 1 (0107):	14.94	1.948	12.00	40.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0107):	14.94	1.948	12.00	40.19
	+ ID2= 2 (0090):	2.50	0.293	12.00	36.36
	ID = 3 (0107):	17.44	2.242	12.00	39.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	17.44	2.242	12.00	39.64
	+ ID2= 2 (0092):	1.27	0.168	12.00	40.62
	ID = 1 (0107):	18.71	2.409	12.00	39.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0106)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	0.7020	0.4603
		0.0190	0.0734	1.0110	0.9685
		0.0360	0.1913	1.0260	1.0011
		0.0460	0.2976	1.1220	1.2435
		0.5590	0.4360	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0107)	18.710	2.409	12.00	39.71
OUTFLOW: ID= 1 (0106)	18.710	0.460	12.30	39.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.09
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.4100

ROUTE PIPE (0105)	
IN= 2---> OUT= 1	Pipe Number = 1.00
DT= 5.0 min	Diameter (mm)=1650.00
	Length (m)= 467.00
	Slope (m/m)= 0.006
	Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0106)	18.71	0.46	12.30	39.65	0.28	1.84
OUTFLOW: ID= 1 (0105)	18.71	0.47	12.30	39.65	0.28	1.84

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0104):	15.14	1.798	12.00	36.79
	+ ID2= 2 (0105):	18.71	0.469	12.30	39.65
	ID = 3 (0099):	33.85	1.873	12.00	38.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
*** W A R N I N G :	HYDROGRAPH 0144 <ID= 2> IS DRY.				
*** W A R N I N G :	HYDROGRAPH 0001 = HYDROGRAPH 0003				
*** W A R N I N G :	HYDROGRAPH 0001 = HYDROGRAPH 0003				
	ID1= 3 (0099):	33.85	1.873	12.00	38.42
	+ ID2= 2 (0144):	0.00	0.000	0.00	0.00
	ID = 1 (0099):	33.85	1.873	12.00	38.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0098)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	0.8190	1.9354
		0.0200	0.0920	0.9260	2.5967
		0.0480	0.2529	1.2030	3.3403
		0.3020	0.3889	1.2340	3.4062
		0.3520	0.4239	4.2880	3.6759
		0.7390	1.5375	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0099)	33.850	1.873	12.00	38.42
OUTFLOW: ID= 1 (0098)	33.850	0.360	13.30	38.38

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.23
TIME SHIFT OF PEAK FLOW (min)= 78.00
MAXIMUM STORAGE USED (ha.m.)= 0.4472

CALIB		
NASHYD (0123)	Area (ha)= 1.61	Curve Number (CN)= 74.0
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.13	

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.072 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 13.177
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.253

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
NASHYD (0124)	Area (ha)= 2.59	Curve Number (CN)= 74.0
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.22	

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.099 (i)

```
     TIME TO PEAK     (hrs)=  12.000
     RUNOFF VOLUME     (mm)=  15.706
     TOTAL RAINFALL    (mm)=  52.121
     RUNOFF COEFFICIENT    =   0.301

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB                |
| STANDHYD  (0086)     |   Area     (ha)=  10.18
|ID= 1 DT=12.0 min     |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       7.63         2.55
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        24.82
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.28         0.14         1.423 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=      51.12        18.32        42.92
     TOTAL RAINFALL   (mm)=      52.12        52.12        52.12
     RUNOFF COEFFICIENT   =       0.98         0.35         0.82

***** 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  (0087)     |   Area     (ha)=   2.21
|ID= 1 DT=12.0 min     |   Total Imp(%)=  85.00   Dir. Conn.(%)=  85.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.88         0.33
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        24.82
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.02         0.334 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=      51.12        18.32        46.20
     TOTAL RAINFALL   (mm)=      52.12        52.12        52.12
     RUNOFF COEFFICIENT   =       0.98         0.35         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  (0097)     |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min     |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.61
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        24.82
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.03         0.074 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=      51.12        18.32        27.50
     TOTAL RAINFALL   (mm)=      52.12        52.12        52.12
     RUNOFF COEFFICIENT   =       0.98         0.35         0.53

***** 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  (0125)     |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min     |   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.37         1.34
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        24.82
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.10
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.90         0.07         0.976 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=      51.12        18.32        44.56
     TOTAL RAINFALL   (mm)=      52.12        52.12        52.12
     RUNOFF COEFFICIENT   =       0.98         0.35         0.85

***** 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.

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--------------------
| ADD HYD   (0122) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0123):     1.61   0.072    12.00    13.18
        + ID2= 2 (0124):     2.59   0.099    12.00    15.71
          ================================================
          ID = 3 (0122):     4.20   0.171    12.00    14.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0122) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0122):     4.20   0.171    12.00    14.74
        + ID2= 2 (0125):     6.71   0.976    12.00    44.56
          ================================================
          ID = 1 (0122):    10.91   1.147    12.00    33.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0122) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0122):    10.91   1.147    12.00    33.08
```

```
          + ID2= 2 (0086):    10.18   1.423    12.00    42.92
            ================================================
            ID = 3 (0122):    21.09   2.570    12.00    37.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0122) |
|   3 +  2 =  1    |
--------------------          AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0122):    21.09   2.570    12.00    37.83
        + ID2= 2 (0087):     2.21   0.334    12.00    46.20
          ================================================
          ID = 1 (0122):    23.30   2.904    12.00    38.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0122) |
|   1 +  2 =  3    |
--------------------          AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0122):    23.30   2.904    12.00    38.62
        + ID2= 2 (0097):     0.85   0.074    12.00    27.50
          ================================================
          ID = 3 (0122):    24.15   2.977    12.00    38.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0120) |
| IN= 2---> OUT= 1 |
| DT= 12.0 min     |      OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------        (cms)     (ha.m.)    |    (cms)     (ha.m.)
                            0.0000     0.0000    |   0.1220      0.9070
                            0.0340     0.1438    |   0.1360      1.1803
                            0.0550     0.3009    |   0.1530      1.5887
                            0.0860     0.4370    |   2.5850      1.7557
                            0.0900     0.4726    |  10.7310      2.0518

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0122)     24.150     2.977     12.00      38.23
     OUTFLOW: ID= 1 (0120)     24.150     0.101     14.20      38.19

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.39
                TIME SHIFT OF PEAK FLOW          (min)=132.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.6232

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0131) |   Area     (ha)=   6.53   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

     Unit Hyd Qpeak  (cms)=   1.313

     PEAK FLOW       (cms)=   0.275 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  15.327
     TOTAL RAINFALL   (mm)=  52.121
     RUNOFF COEFFICIENT   =   0.294

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0128) |   Area     (ha)=   2.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.29          1.05
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=     60.45         24.82
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=      0.22          0.06          0.274 (iii)
     TIME TO PEAK    (hrs)=     12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=     51.12         18.32         36.36
     TOTAL RAINFALL   (mm)=     52.12         52.12         52.12
     RUNOFF COEFFICIENT   =      0.98          0.35          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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0130) |   Area     (ha)=   0.97
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.62          0.35
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n           =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=     60.45         24.82
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      1.23 (ii)     9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.10
                                                          *TOTALS*
     PEAK FLOW       (cms)=      0.10          0.02          0.124 (iii)
     TIME TO PEAK    (hrs)=     12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=     51.12         18.32         39.30
     TOTAL RAINFALL   (mm)=     52.12         52.12         52.12
     RUNOFF COEFFICIENT   =      0.98          0.35          0.75

***** 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   (0129) |
|   1 +  2 =  3    |
--------------------          AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0128):     2.34   0.274    12.00    36.36
        + ID2= 2 (0130):     0.97   0.124    12.00    39.30
          ================================================
          ID = 3 (0129):     3.31   0.398    12.00    37.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0129) |
|   3 +  2 =  1    |
--------------------          AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0129):     3.31   0.398    12.00    37.22
        + ID2= 2 (0131):     6.53   0.275    12.00    15.33
          ================================================
          ID = 1 (0129):     9.84   0.673    12.00    22.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0134) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.204

     PEAK FLOW       (cms)=   0.040 (i)
```

```
     TIME TO PEAK     (hrs)=  12.000
     RUNOFF VOLUME     (mm)=  14.903
     TOTAL RAINFALL    (mm)=  52.121
     RUNOFF COEFFICIENT    =   0.286

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB                |
| STANDHYD  (0095)     |   Area     (ha)=   2.95
|ID= 1 DT=12.0 min     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.74         2.21
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     60.45        24.82
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW        (cms)=     0.12         0.12      0.246 (iii)
     TIME TO PEAK     (hrs)=    12.00        12.00      12.00
     RUNOFF VOLUME     (mm)=    51.12        18.32      26.52
     TOTAL RAINFALL    (mm)=    52.12        52.12      52.12
     RUNOFF COEFFICIENT   =     0.98         0.35       0.51

***** 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  (0133)     |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.18         2.68
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     60.45        24.82
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW        (cms)=     0.70         0.15      0.851 (iii)
     TIME TO PEAK     (hrs)=    12.00        12.00      12.00
     RUNOFF VOLUME     (mm)=    51.12        18.32      38.33
     TOTAL RAINFALL    (mm)=    52.12        52.12      52.12
     RUNOFF COEFFICIENT   =     0.98         0.35       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.

--------------------------------------------------------------------------------
--------------------
| CALIB                |
| STANDHYD  (0135)     |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.36         1.51
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     60.45        24.82
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.23 (ii)    9.36 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.10
                                                    *TOTALS*
     PEAK FLOW        (cms)=     0.40         0.08      0.480 (iii)
     TIME TO PEAK     (hrs)=    12.00        12.00      12.00
     RUNOFF VOLUME     (mm)=    51.12        18.32      38.33
     TOTAL RAINFALL    (mm)=    52.12        52.12      52.12
     RUNOFF COEFFICIENT   =     0.98         0.35       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   (0132)     |
|   1 +  2 =  3        |          AREA    QPEAK    TPEAK     R.V.
--------------------                (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0133):     6.86   0.851    12.00     38.33
        + ID2= 2 (0134):     0.91   0.040    12.00     14.90
          ==========================================================
          ID = 3 (0132):     7.77   0.891    12.00     35.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0132)     |
|   3 +  2 =  1        |          AREA    QPEAK    TPEAK     R.V.
--------------------                (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0132):     7.77   0.891    12.00     35.58
        + ID2= 2 (0135):     3.87   0.480    12.00     38.33
          ==========================================================
          ID = 1 (0132):    11.64   1.371    12.00     36.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0132)     |
|   1 +  2 =  3        |          AREA    QPEAK    TPEAK     R.V.
--------------------                (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0132):    11.64   1.371    12.00     36.50
        + ID2= 2 (0095):     2.95   0.246    12.00     26.52
          ==========================================================
          ID = 3 (0132):    14.59   1.617    12.00     34.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0127)     |
| IN= 2---> OUT= 1     |
| DT=  5.0 min         |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)    |   (cms)     (ha.m.)
                           0.0000     0.0000    |   0.6510     0.4563
                           0.1220     0.1110    |   0.8770     0.7650
                           0.3620     0.2096    |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0132)     14.590     1.617     12.00      34.48
     OUTFLOW: ID= 1 (0127)     14.590     0.365     12.20      34.46

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.58
                  TIME SHIFT OF PEAK FLOW          (min)= 12.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.2130

--------------------------------------------------------------------------------
--------------------
| ROUTE PIPE (0119)    |     PIPE Number      =   1.00
| IN= 2---> OUT= 1     |     Diameter     (mm)=1650.00
| DT= 12.0 min         |     Length        (m)= 500.00
--------------------       Slope       (m/m)=  0.005
                           Manning n        =  0.013
```

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<-------------- TRAVEL TIME TABLE ------------------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<--pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.37	12.20	34.46	0.27	1.62
OUTFLOW: ID= 1 (0119)	14.59	0.37	12.30	34.46	0.27	1.63

ADD HYD (0118) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0119):	14.59	0.367	12.30	34.46
+ ID2= 2 (0129):	9.84	0.673	12.00	22.69
ID = 3 (0118):	24.43	0.848	12.00	29.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126)
IN= 2---> OUT= 1
DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	0.848	12.00	29.74
OUTFLOW: ID= 1 (0126)	24.430	0.363	12.90	29.74

PEAK FLOW REDUCTION [Qout/Qin](%)= 42.75
TIME SHIFT OF PEAK FLOW (min)= 54.00
MAXIMUM STORAGE USED (ha.m.)= 0.1609

ADD HYD (0155) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0120):	24.15	0.101	14.20	38.19
+ ID2= 2 (0126):	24.43	0.363	12.90	29.74
ID = 3 (0155):	48.58	0.462	12.90	33.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0147)
ID= 1 DT= 5.0 min

Area (ha)= 1.49 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	0.51	6.083	1.02	12.083	10.67	18.08	0.76								
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76								
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76								
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76								
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76								
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76								
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76								
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76								
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76								
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76								
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76								
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76								
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76								
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76								
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76								
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76								
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76								
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76								
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76								
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76								
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76								
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76								
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76								
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76								
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51								
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51								
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51								
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51								
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51								
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51								
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51								
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51								
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51								
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51								
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51								
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51								
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51								
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51								
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51								
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51								
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51								
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51								
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51								
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51								
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51								
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51								
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51								
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51								
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51								
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51								
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51								
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51								
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51								
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51								
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51								
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51								
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51								
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51								
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51								
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51								
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51								
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51								
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51								
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51								
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51								
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51								
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51								
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51								
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51								
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51								
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51								
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51								

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 16.261
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.312

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB                |
| STANDHYD  (0146)     |   Area    (ha)=   2.59
|ID= 1 DT= 5.0 min     |   Total Imp(%)=  44.00   Dir. Conn.(%)=  44.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.14         1.45
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00        30.00
     Length            (m)=      20.75        10.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.45        25.46
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       0.99 (ii)    2.82 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.28
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.11          0.296 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      51.12        18.32          32.75
     TOTAL RAINFALL   (mm)=      52.12        52.12          52.12
     RUNOFF COEFFICIENT   =       0.98         0.35           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.

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--------------------
| ADD HYD   (0148) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0146):      2.59   0.296    12.00    32.75
       + ID2= 2 (0147):      1.49   0.056    12.08    16.26
         ================================================
         ID = 3 (0148):      4.07   0.344    12.00    26.74

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0148) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0148):      4.07   0.344    12.00    26.74
       + ID2= 2 (0155):     48.58   0.462    12.90    33.94
         ================================================
         ID = 1 (0148):     52.65   0.550    12.00    33.38

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************


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|    READ STORM    |    Filename: C:\Users\DMcBrayne\AppD
|                  |              ata\Local\Temp\
|                  |              99de1fdc-d6ae-4e6e-b844-585c8b2021ad\d847643a
| Ptotal= 62.43 mm |    Comments: FIVE YR SCS STORM  WITH A TWELVE MINUTE
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	0.76	6.20	1.27	12.20	12.19	18.20	1.27
0.40	0.76	6.40	1.27	12.40	7.62	18.40	1.27
0.60	0.76	6.60	1.27	12.60	5.59	18.60	1.27
0.80	0.76	6.80	1.27	12.80	5.08	18.80	1.27
1.00	0.76	7.00	1.27	13.00	3.81	19.00	1.27
1.20	0.76	7.20	1.27	13.20	3.05	19.20	1.02
1.40	0.76	7.40	1.27	13.40	3.05	19.40	1.02
1.60	0.76	7.60	1.27	13.60	3.05	19.60	1.02
1.80	0.76	7.80	1.27	13.80	3.05	19.80	1.02
2.00	0.76	8.00	1.27	14.00	3.05	20.00	1.02
2.20	0.76	8.20	1.78	14.20	1.78	20.20	1.02
2.40	0.76	8.40	1.78	14.40	1.78	20.40	1.02
2.60	0.76	8.60	1.78	14.60	1.78	20.60	1.02
2.80	0.76	8.80	1.78	14.80	1.78	20.80	1.02
3.00	0.76	9.00	1.78	15.00	1.78	21.00	1.02
3.20	0.76	9.20	1.78	15.20	1.78	21.20	0.76
3.40	0.76	9.40	1.78	15.40	1.78	21.40	0.76
3.60	0.76	9.60	1.78	15.60	1.78	21.60	0.76
3.80	0.76	9.80	1.78	15.80	1.78	21.80	0.76
4.00	0.76	10.00	1.78	16.00	1.78	22.00	0.76
4.20	1.27	10.20	3.30	16.20	1.27	22.20	0.76
4.40	1.27	10.40	3.30	16.40	1.27	22.40	0.76
4.60	1.27	10.60	3.30	16.60	1.27	22.60	0.76
4.80	1.27	10.80	3.30	16.80	1.27	22.80	0.76
5.00	1.27	11.00	3.30	17.00	1.27	23.00	0.76
5.20	1.27	11.20	4.57	17.20	1.27	23.20	0.76
5.40	1.27	11.40	6.60	17.40	1.27	23.40	0.76
5.60	1.27	11.60	15.24	17.60	1.27	23.60	0.76
5.80	1.27	11.80	33.27	17.80	1.27	23.80	0.76
6.00	1.27	12.00	69.60	18.00	1.27	24.00	0.76

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| CALIB                |
| NASHYD    (0114)     |   Area    (ha)=   2.11   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   |   U.H. Tp(hrs)=   0.26

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.093 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  22.051
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.353

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB                |
| STANDHYD  (0084)     |   Area    (ha)=  10.64
|ID= 1 DT=12.0 min     |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       7.45         3.19
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       1.44         0.24          1.676 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72          50.42
     TOTAL RAINFALL   (mm)=      62.43        62.43          62.43
     RUNOFF COEFFICIENT   =       0.98         0.40           0.81

***** 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.

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--------------------
| CALIB                |
| STANDHYD  (0085)     |   Area    (ha)=   8.53
|ID= 1 DT=12.0 min     |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.80         2.73
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                    *TOTALS*
```

PEAK FLOW	(cms)=	1.12	0.20	1.323 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	49.69
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.80

***** 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 (0108) | Area (ha)= 1.50
ID= 1 DT=12.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.96	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		69.60	32.00
over (min)		12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.19	0.04	0.226 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	48.21
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.77

***** 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.

DUHYD (0089)
Inlet Cap.=0.350
#of Inlets= 1
Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.23	12.00	48.21
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.50	0.23	12.00	48.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0113) | Area (ha)= 1.21
ID= 1 DT=12.0 min | Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.67	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		69.60	32.00
over (min)		12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.13	0.04	0.169 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	44.91
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	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.

CALIB
STANDHYD (0115) | Area (ha)= 17.98
ID= 1 DT=12.0 min | Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	10.97	7.01
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		69.60	32.00
over (min)		12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	2.12	0.52	2.639 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	47.12
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.75

***** 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 (0112)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0113):	1.21	0.169	12.00	44.91
+ ID2= 2 (0114):	2.11	0.093	12.00	22.05
ID = 3 (0112):	3.32	0.262	12.00	30.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	3.32	0.262	12.00	30.38
+ ID2= 2 (0115):	17.98	2.639	12.00	47.12
ID = 1 (0112):	21.30	2.901	12.00	44.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	21.30	2.901	12.00	44.51
+ ID2= 2 (0084):	10.64	1.676	12.00	50.42
ID = 3 (0112):	31.94	4.576	12.00	46.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
          ID1= 3 (0112):    31.94   4.576    12.00    46.48
        + ID2= 2 (0085):     8.53   1.323    12.00    49.69
          ================================================
          ID = 1 (0112):    40.47   5.899    12.00    47.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0112) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0089 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
          ID1= 1 (0112):    40.47   5.899    12.00    47.15
        + ID2= 2 (0089):     0.00   0.000     0.00     0.00
          ================================================
          ID = 3 (0112):    40.47   5.899    12.00    47.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0137) |   Area     (ha)=   1.33   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=    0.391

     PEAK FLOW       (cms)=    0.079 (i)
     TIME TO PEAK    (hrs)=   12.000
     RUNOFF VOLUME    (mm)=   18.199
     TOTAL RAINFALL   (mm)=   62.433
     RUNOFF COEFFICIENT   =    0.292

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0096) |   Area     (ha)=   3.62
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
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                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.01          2.61
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n          =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=     69.60         32.00
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      1.16 (ii)     8.51 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.20          0.19      0.389 (iii)
     TIME TO PEAK    (hrs)=     12.00         12.00      12.00
     RUNOFF VOLUME    (mm)=     61.43         24.72      35.00
     TOTAL RAINFALL   (mm)=     62.43         62.43      62.43
     RUNOFF COEFFICIENT   =      0.98          0.40       0.56

***** 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.

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| CALIB            |
| STANDHYD  (0138) |   Area     (ha)=   1.45
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.93          0.52
     Dep. Storage     (mm)=      1.00          1.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=     30.00         20.00
     Mannings n          =     0.013         0.250

     Max.Eff.Inten.(mm/hr)=     69.60         32.00
               over (min)       12.00         12.00
     Storage Coeff.  (min)=      1.16 (ii)     8.51 (ii)
     Unit Hyd. Tpeak (min)=     12.00         12.00
     Unit Hyd. peak  (cms)=      0.14          0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.18          0.04      0.218 (iii)
     TIME TO PEAK    (hrs)=     12.00         12.00      12.00
     RUNOFF VOLUME    (mm)=     61.43         24.72      48.21
     TOTAL RAINFALL   (mm)=     62.43         62.43      62.43
     RUNOFF COEFFICIENT   =      0.98          0.40       0.77

***** 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.

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| ADD HYD   (0136) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0137):     1.33   0.079    12.00    18.20
        + ID2= 2 (0138):     1.45   0.218    12.00    48.21
          ================================================
          ID = 3 (0136):     2.78   0.297    12.00    33.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0136) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0136):     2.78   0.297    12.00    33.85
        + ID2= 2 (0096):     3.62   0.389    12.00    35.00
          ================================================
          ID = 1 (0136):     6.40   0.685    12.00    34.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0117) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |  0.3260      0.8017
                         0.0790     0.1850    |  0.3960      0.9004
                         0.2270     0.3947    |  0.0000      0.0000

                              AREA     QPEAK     TPEAK      R.V.
                               (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0136)    6.400     0.685     12.00     34.50
     OUTFLOW: ID= 1 (0117)    6.400     0.051     13.00     34.41

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.39
                TIME SHIFT OF PEAK FLOW         (min)= 60.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.1187

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| ROUTE PIPE (0116)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 850.00
--------------------     Slope      (m/m)=  0.005
                         Manning n        =  0.013

     <----------------- TRAVEL TIME TABLE ---------------------->
       DEPTH       VOLUME     FLOW RATE     VELOCITY     TRAV.TIME
        (m)       (cu.m.)       (cms)         (m/s)         min
       0.09     .367E+02        0.0           0.80         17.68
       0.17     .102E+03        0.1           1.25         11.33
       0.26     .184E+03        0.3           1.61          8.81
       0.35     .278E+03        0.6           1.91          7.41
       0.43     .382E+03        1.0           2.18          6.51
       0.52     .492E+03        1.4           2.41          5.88
       0.61     .608E+03        1.9           2.61          5.43
       0.69     .727E+03        2.4           2.79          5.08
       0.78     .848E+03        2.9           2.95          4.81
       0.87     .970E+03        3.5           3.08          4.60
```

0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0117)	6.40	0.05	13.00	34.41	0.10	0.84
OUTFLOW: ID= 1 (0116)	6.40	0.05	13.30	34.41	0.10	0.84

ADD HYD (0111)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	40.47	5.899	12.00	47.15
+ ID2= 2 (0116):	6.40	0.050	13.30	34.41
ID = 3 (0111):	46.87	5.919	12.00	45.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0110)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.0010	1.0368
0.0410	0.1625	1.4640	1.1396
0.0970	0.4197	1.6230	1.3517
0.1600	0.6939	2.0260	2.0441
0.5090	0.8867	2.6870	2.2310
0.6570	0.9362	6.1640	2.6224

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0111)	46.870	5.919	12.00	45.43
OUTFLOW: ID= 1 (0110)	46.870	0.996	12.30	45.41

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.82
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 1.0374

DUHYD (0144)
Inlet Cap.=2.787
#of Inlets= 1
Total(cms)= 2.8

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	46.87	1.00	12.30	45.41
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	46.87	1.00	12.30	45.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0081)
ID= 1 DT=12.0 min

Area (ha)= 1.34
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.00	0.34
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	69.60	32.00
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.19	0.02	0.219 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	52.25
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	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 (0082)
ID= 1 DT=12.0 min

Area (ha)= 2.51
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.88	0.63
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	69.60	32.00
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.36	0.05	0.410 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	52.25
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	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 (0101)
ID= 1 DT=12.0 min

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.33	0.14
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	69.60	32.00
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.06	0.01	0.074 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	50.41
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.81

***** 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 (0088)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	0.47	0.074	12.00	50.41
+ ID2= 2 (0082):	2.51	0.410	12.00	52.25

ID = 3 (0088):	2.98	0.484	12.00	51.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0093) | Inlet Cap.=0.934 | #of Inlets= 1 | Total(cms)= 0.9

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.48	12.00	51.96
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.98	0.48	12.00	51.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | STANDHYD (0094) | ID= 1 DT=12.0 min | Area (ha)= 2.25 | Total Imp(%)= 60.00 | Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.35	0.90	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.26	0.07	0.328 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	46.75
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.75

***** 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 (0100) | ID= 1 DT=12.0 min | Area (ha)= 1.27 | Total Imp(%)= 68.00 | Dir. Conn.(%)= 68.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.86	0.41	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.17	0.03	0.197 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	49.68
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.80

***** 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.

DUHYD (0092) | Inlet Cap.=0.309 | #of Inlets= 1 | Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.20	12.00	49.68
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.27	0.20	12.00	49.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | STANDHYD (0102) | ID= 1 DT=12.0 min | Area (ha)= 2.71 | Total Imp(%)= 25.00 | Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.68	2.03	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.13	0.15	0.281 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	33.90
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.54

***** 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 (0103) | ID= 1 DT=12.0 min | Area (ha)= 5.86 | Total Imp(%)= 56.00 | Dir. Conn.(%)= 56.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.28	2.58	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.63	0.19	0.825 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	45.28
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.73

***** 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 (0104) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	2.71	0.281	12.00	33.90

```
        + ID2= 2 (0103):     5.86   0.825    12.00    45.28
          ================================================
          ID = 3 (0104):     8.57   1.106    12.00    41.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0104) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)      (mm)
          ID1= 3 (0104):     8.57   1.106    12.00    41.68
        + ID2= 2 (0081):     1.34   0.219    12.00    52.25
          ================================================
          ID = 1 (0104):     9.91   1.325    12.00    43.11

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)      (mm)
*** W A R N I N G :  HYDROGRAPH 0092 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
          ID1= 1 (0104):     9.91   1.325    12.00    43.11
        + ID2= 2 (0092):     0.00   0.000     0.00     0.00
          ================================================
          ID = 3 (0104):     9.91   1.325    12.00    43.11

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0104) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)      (mm)
          ID1= 3 (0104):     9.91   1.325    12.00    43.11
        + ID2= 2 (0093):     2.98   0.484    12.00    51.96
          ================================================
          ID = 1 (0104):    12.89   1.810    12.00    45.16

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)      (mm)
          ID1= 1 (0104):    12.89   1.810    12.00    45.16
        + ID2= 2 (0094):     2.25   0.328    12.00    46.75
          ================================================
          ID = 3 (0104):    15.14   2.137    12.00    45.39

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| CALIB            |
| STANDHYD  (0083) |   Area    (ha)=   3.28
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.30         0.98
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     69.60        32.00
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.44         0.07      0.517 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=     61.43        24.72       50.42
     TOTAL RAINFALL   (mm)=     62.43        62.43       62.43
     RUNOFF COEFFICIENT   =      0.98         0.40        0.81

***** 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.

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------------------
| CALIB            |
| STANDHYD  (0091) |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.38         1.12
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     69.60        32.00
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.27         0.08      0.349 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=     61.43        24.72       44.91
     TOTAL RAINFALL   (mm)=     62.43        62.43       62.43
     RUNOFF COEFFICIENT   =      0.98         0.40        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.

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------------------
| DUHYD     (0090) |
| Inlet Cap.=0.502 |
| #of Inlets=    1 |
| Total(cms)=  0.5 |          AREA     QPEAK     TPEAK     R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
     TOTAL HYD.(ID= 1):     2.50      0.35     12.00    44.91
     ================================================================
     MAJOR SYS.(ID= 2):     0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):     2.50      0.35     12.00    44.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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------------------
| CALIB            |
| STANDHYD  (0109) |   Area    (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      6.71         3.45
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     69.60        32.00
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.30         0.26      1.552 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=     61.43        24.72       48.95
     TOTAL RAINFALL   (mm)=     62.43        62.43       62.43
     RUNOFF COEFFICIENT   =      0.98         0.40        0.78

***** 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.
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(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0109):	10.16	1.552	12.00	48.95
	+ ID2= 2 (0083):	3.28	0.517	12.00	50.42
	ID = 3 (0107):	13.44	2.068	12.00	49.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	13.44	2.068	12.00	49.31
	+ ID2= 2 (0089):	1.50	0.226	12.00	48.21
	ID = 1 (0107):	14.94	2.294	12.00	49.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0107):	14.94	2.294	12.00	49.20
	+ ID2= 2 (0090):	2.50	0.349	12.00	44.91
	ID = 3 (0107):	17.44	2.643	12.00	48.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	17.44	2.643	12.00	48.58
	+ ID2= 2 (0092):	1.27	0.197	12.00	49.68
	ID = 1 (0107):	18.71	2.840	12.00	48.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0106)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	0.7020	0.4603
		0.0190	0.0734	1.0110	0.9685
		0.0360	0.1913	1.0260	1.0011
		0.0460	0.2976	1.1220	1.2435
		0.5590	0.4360	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0107)	18.710	2.840	12.00	48.66
OUTFLOW: ID= 1 (0106)	18.710	0.707	12.20	48.61

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.91
TIME SHIFT OF PEAK FLOW (min)= 12.00
MAXIMUM STORAGE USED (ha.m.)= 0.4708

ROUTE PIPE (0105)		
IN= 2---> OUT= 1	Pipe Number	= 1.00
DT= 5.0 min	Diameter (mm)	=1650.00
	Length (m)	= 467.00
	Slope (m/m)	= 0.006
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW :	ID= 2 (0106)	18.71	0.71	12.20	48.61	0.35	2.11
OUTFLOW:	ID= 1 (0105)	18.71	0.72	12.30	48.61	0.35	2.12

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0104):	15.14	2.137	12.00	45.39
	+ ID2= 2 (0105):	18.71	0.719	12.30	48.61
	ID = 3 (0099):	33.85	2.312	12.00	47.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0144 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003

	ID1= 3 (0099):	33.85	2.312	12.00	47.22
	+ ID2= 2 (0144):	0.00	0.000	0.00	0.00
	ID = 1 (0099):	33.85	2.312	12.00	47.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0098)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	0.8190	1.9354
		0.0200	0.0920	0.9260	2.5967
		0.0480	0.2529	1.2030	3.3403
		0.3020	0.3889	1.2340	3.4062
		0.3520	0.4239	4.2880	3.6759
		0.7390	1.5375	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0099)	33.850	2.312	12.00	47.22
OUTFLOW: ID= 1 (0098)	33.850	0.406	13.40	47.18

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.57
TIME SHIFT OF PEAK FLOW (min)= 84.00
MAXIMUM STORAGE USED (ha.m.)= 0.5800

CALIB				
NASHYD (0123)	Area	(ha)= 1.61	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)= 5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)= 0.13		

Unit Hyd Qpeak (cms)= 0.473

```
     PEAK FLOW       (cms)=   0.095 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  18.199
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.292

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB           |
| NASHYD    (0124)|   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min|   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.132 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  21.692
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.347

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0086)|   Area     (ha)=  10.18
|ID= 1 DT=12.0 min|   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       7.63         2.55
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.48         0.19      1.664 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72      52.26
     TOTAL RAINFALL   (mm)=      62.43        62.43      62.43
     RUNOFF COEFFICIENT   =       0.98         0.40       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.

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-------------------
| CALIB           |
| STANDHYD  (0087)|   Area     (ha)=   2.21
|ID= 1 DT=12.0 min|   Total Imp(%)=  85.00   Dir. Conn.(%)=  85.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.88         0.33
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.36         0.02      0.388 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72      55.93
     TOTAL RAINFALL   (mm)=      62.43        62.43      62.43
     RUNOFF COEFFICIENT   =       0.98         0.40       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.

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| CALIB           |
| STANDHYD  (0097)|   Area     (ha)=   0.85
|ID= 1 DT=12.0 min|   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.61
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.05      0.091 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72      35.00
     TOTAL RAINFALL   (mm)=      62.43        62.43      62.43
     RUNOFF COEFFICIENT   =       0.98         0.40       0.56

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0125)|   Area     (ha)=   6.71
|ID= 1 DT=12.0 min|   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
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                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.37         1.34
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      69.60        32.00
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.16 (ii)    8.51 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.04         0.10      1.137 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=      61.43        24.72      54.09
     TOTAL RAINFALL   (mm)=      62.43        62.43      62.43
     RUNOFF COEFFICIENT   =       0.98         0.40       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.

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| ADD HYD   (0122)|
|   1 +  2 =  3   |
-------------------          AREA    QPEAK    TPEAK     R.V.
                             (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0123):     1.61    0.095    12.00    18.20
        + ID2= 2 (0124):     2.59    0.132    12.00    21.69
          ==========================================================
          ID = 3 (0122):     4.20    0.227    12.00    20.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0122):     4.20   0.227    12.00    20.35
       + ID2= 2 (0125):     6.71   1.137    12.00    54.09
         ================================================
         ID = 1 (0122):    10.91   1.364    12.00    41.10

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0122):    10.91   1.364    12.00    41.10
       + ID2= 2 (0086):    10.18   1.664    12.00    52.26
         ================================================
         ID = 3 (0122):    21.09   3.028    12.00    46.49

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0122):    21.09   3.028    12.00    46.49
       + ID2= 2 (0087):     2.21   0.388    12.00    55.93
         ================================================
         ID = 1 (0122):    23.30   3.416    12.00    47.38

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0122):    23.30   3.416    12.00    47.38
       + ID2= 2 (0097):     0.85   0.091    12.00    35.00
         ================================================
         ID = 3 (0122):    24.15   3.507    12.00    46.95

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0120) |
| IN= 2---> OUT= 1 |
| DT= 12.0 min     |      OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------        (cms)     (ha.m.)    |    (cms)     (ha.m.)
                           0.0000     0.0000    |    0.1220     0.9070
                           0.0340     0.1438    |    0.1360     1.1803
                           0.0550     0.3009    |    0.1530     1.5887
                           0.0860     0.4370    |    2.5850     1.7557
                           0.0900     0.4726    |   10.7310     2.0518

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (0122)     24.150     3.507     12.00      46.95
    OUTFLOW: ID= 1 (0120)     24.150     0.110     14.20      46.90

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.14
                  TIME SHIFT OF PEAK FLOW          (min)=132.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.7438

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-------------------
| CALIB            |
| NASHYD    (0131) |   Area     (ha)=   6.53   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

    Unit Hyd Qpeak  (cms)=   1.313

    PEAK FLOW       (cms)=   0.365 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  21.169
    TOTAL RAINFALL   (mm)=  62.433
    RUNOFF COEFFICIENT   =   0.339
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0128) |   Area     (ha)=   2.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=        1.29          1.05
    Dep. Storage     (mm)=        1.00          1.50
    Average Slope     (%)=        2.00          2.00
    Length            (m)=       30.00         20.00
    Mannings n           =       0.013         0.250

    Max.Eff.Inten.(mm/hr)=       69.60         32.00
                  over (min)     12.00         12.00
    Storage Coeff.  (min)=        1.16 (ii)     8.51 (ii)
    Unit Hyd. Tpeak (min)=       12.00         12.00
    Unit Hyd. peak  (cms)=        0.14          0.11
                                                          *TOTALS*
    PEAK FLOW       (cms)=        0.25          0.08        0.327 (iii)
    TIME TO PEAK    (hrs)=       12.00         12.00        12.00
    RUNOFF VOLUME    (mm)=       61.43         24.72        44.91
    TOTAL RAINFALL   (mm)=       62.43         62.43        62.43
    RUNOFF COEFFICIENT   =        0.98          0.40         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.

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-------------------
| CALIB            |
| STANDHYD  (0130) |   Area     (ha)=   0.97
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=        0.62          0.35
    Dep. Storage     (mm)=        1.00          1.50
    Average Slope     (%)=        2.00          2.00
    Length            (m)=       30.00         20.00
    Mannings n           =       0.013         0.250

    Max.Eff.Inten.(mm/hr)=       69.60         32.00
                  over (min)     12.00         12.00
    Storage Coeff.  (min)=        1.16 (ii)     8.51 (ii)
    Unit Hyd. Tpeak (min)=       12.00         12.00
    Unit Hyd. peak  (cms)=        0.14          0.11
                                                          *TOTALS*
    PEAK FLOW       (cms)=        0.12          0.03        0.146 (iii)
    TIME TO PEAK    (hrs)=       12.00         12.00        12.00
    RUNOFF VOLUME    (mm)=       61.43         24.72        48.21
    TOTAL RAINFALL   (mm)=       62.43         62.43        62.43
    RUNOFF COEFFICIENT   =        0.98          0.40         0.77

***** 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.

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| ADD HYD   (0129) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0128):     2.34   0.327    12.00    44.91
       + ID2= 2 (0130):     0.97   0.146    12.00    48.21
         ================================================
         ID = 3 (0129):     3.31   0.472    12.00    45.88

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0129) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
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	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0129):	3.31	0.472	12.00	45.88
+ ID2= 2 (0131):	6.53	0.365	12.00	21.17
ID = 1 (0129):	9.84	0.837	12.00	29.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0134) ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 20.584
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.330

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0095) ID= 1 DT=12.0 min

Area (ha)= 2.95
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.74	2.21	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.14	0.16	0.306 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	33.90
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.54

***** 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 (0133) ID= 1 DT=12.0 min

Area (ha)= 6.86
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.81	0.20	1.007 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	47.12
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.75

***** 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 (0135) ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.36	1.51	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	69.60	32.00	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.16 (ii)	8.51 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.46	0.11	0.568 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	47.12
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.75

***** 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 (0132) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0133):	6.86	1.007	12.00	47.12
+ ID2= 2 (0134):	0.91	0.053	12.00	20.58
ID = 3 (0132):	7.77	1.060	12.00	44.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0132):	7.77	1.060	12.00	44.01
+ ID2= 2 (0135):	3.87	0.568	12.00	47.12
ID = 1 (0132):	11.64	1.628	12.00	45.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0132):	11.64	1.628	12.00	45.04
+ ID2= 2 (0095):	2.95	0.306	12.00	33.90
ID = 3 (0132):	14.59	1.934	12.00	42.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0127) IN= 2---> OUT= 1 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0132)	14.590	1.934	12.00	42.79
OUTFLOW: ID= 1 (0127)	14.590	0.412	12.30	42.77

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.30
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.2529

ROUTE PIPE (0119) | IN= 2---> OUT= 1 | DT= 12.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.41	12.30	42.77	0.28	1.67
OUTFLOW: ID= 1 (0119)	14.59	0.41	12.30	42.77	0.28	1.67

ADD HYD (0118) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0119):	14.59	0.412	12.30	42.77
+ ID2= 2 (0129):	9.84	0.837	12.00	29.48
ID = 3 (0118):	24.43	1.073	12.00	37.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126) | IN= 2---> OUT= 1 | DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	1.073	12.00	37.45
OUTFLOW: ID= 1 (0126)	24.430	0.401	13.10	37.45

PEAK FLOW REDUCTION [Qout/Qin](%)= 37.38
TIME SHIFT OF PEAK FLOW (min)= 66.00
MAXIMUM STORAGE USED (ha.m.)= 0.2006

ADD HYD (0155) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0120):	24.15	0.110	14.20	46.90
+ ID2= 2 (0126):	24.43	0.401	13.10	37.45
ID = 3 (0155):	48.58	0.510	13.10	42.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | NASHYD (0147) | ID= 1 DT= 5.0 min

Area (ha)= 1.49 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76

5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.074 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 22.459
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.360

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0146)
ID= 1 DT= 5.0 min

Area (ha)= 2.59
Total Imp(%)= 44.00 Dir. Conn.(%)= 44.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.14	1.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	30.00
Length	(m)=	20.75	10.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	69.60	32.75
over	(min)	5.00	5.00
Storage Coeff.	(min)=	0.93 (ii)	2.67 (ii)
Unit Hyd. Tpeak	(min)=	5.00	5.00
Unit Hyd. peak	(cms)=	0.34	0.29

				TOTALS
PEAK FLOW	(cms)=	0.22	0.14	0.355 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	61.43	24.72	40.88
TOTAL RAINFALL	(mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT	=	0.98	0.40	0.65

***** 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 (0148)
1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0146):		2.59	0.355	12.00	40.88
+ ID2= 2 (0147):		1.49	0.074	12.08	22.46
ID = 3 (0148):		4.07	0.420	12.00	34.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0148)
3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0148):		4.07	0.420	12.00	34.16
+ ID2= 2 (0155):		48.58	0.510	13.10	42.15
ID = 1 (0148):		52.65	0.707	12.00	41.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 3 **
****

READ STORM
Ptotal= 82.45 mm

Filename: C:\Users\DMcBrayne\AppData\Local\Temp\99de1fdc-d6ae-4e6e-b844-585c8b2021ad\0d4474df
Comments: TEN YR SCS STORM 24HR TWELVE MIN TIME ST

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	0.76	6.20	1.78	12.20	92.20	18.20	1.78
0.40	0.76	6.40	1.78	12.40	16.00	18.40	1.78
0.60	0.76	6.60	1.78	12.60	10.16	18.60	1.78
0.80	0.76	6.80	1.78	12.80	7.37	18.80	1.78
1.00	0.76	7.00	1.78	13.00	6.86	19.00	1.78
1.20	0.76	7.20	1.78	13.20	4.83	19.20	1.78
1.40	0.76	7.40	1.78	13.40	4.06	19.40	1.27
1.60	0.76	7.60	1.78	13.60	4.06	19.60	1.27
1.80	0.76	7.80	1.78	13.80	4.06	19.80	1.27
2.00	0.76	8.00	1.78	14.00	4.06	20.00	1.27
2.20	0.76	8.20	1.78	14.20	4.06	20.20	1.27
2.40	0.76	8.40	2.54	14.40	2.54	20.40	1.27
2.60	0.76	8.60	2.54	14.60	2.54	20.60	1.27
2.80	0.76	8.80	2.54	14.80	2.54	20.80	1.27
3.00	0.76	9.00	2.54	15.00	2.54	21.00	1.27
3.20	0.76	9.20	2.54	15.20	2.54	21.20	1.27
3.40	0.76	9.40	2.54	15.40	2.54	21.40	0.76
3.60	0.76	9.60	2.54	15.60	2.54	21.60	0.76
3.80	0.76	9.80	2.54	15.80	2.54	21.80	0.76
4.00	0.76	10.00	2.54	16.00	2.54	22.00	0.76
4.20	0.76	10.20	2.54	16.20	2.54	22.20	0.76
4.40	1.78	10.40	4.57	16.40	1.78	22.40	0.76
4.60	1.78	10.60	4.57	16.60	1.78	22.60	0.76
4.80	1.78	10.80	4.57	16.80	1.78	22.80	0.76
5.00	1.78	11.00	4.57	17.00	1.78	23.00	0.76
5.20	1.78	11.20	4.57	17.20	1.78	23.20	0.76
5.40	1.78	11.40	6.10	17.40	1.78	23.40	0.76
5.60	1.78	11.60	8.89	17.60	1.78	23.60	0.76
5.80	1.78	11.80	20.07	17.80	1.78	23.80	0.76
6.00	1.78	12.00	44.20	18.00	1.78	24.00	0.76

CALIB
NASHYD (0114)
ID= 1 DT=12.0 min

Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.153 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 35.282
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.428

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0084)
ID= 1 DT=12.0 min

Area (ha)= 10.64
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	7.45	3.19
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	92.20	50.35
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	1.91	0.39	2.298 (iii)
TIME TO PEAK	(hrs)=	12.20	12.20	12.20
RUNOFF VOLUME	(mm)=	81.45	38.50	68.56
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.47	0.83

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0085)|   Area    (ha)=   8.53
|ID= 1 DT=12.0 min|   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      5.80         2.73
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     92.20        50.35
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.49         0.33       1.820 (iii)
     TIME TO PEAK    (hrs)=     12.20        12.20       12.20
     RUNOFF VOLUME    (mm)=     81.45        38.50       67.70
     TOTAL RAINFALL   (mm)=     82.45        82.45       82.45
     RUNOFF COEFFICIENT   =      0.99         0.47        0.82

***** 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.
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-------------------
| CALIB           |
| STANDHYD  (0108)|   Area    (ha)=   1.50
|ID= 1 DT=12.0 min|   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.96         0.54
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     92.20        50.35
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.25         0.07       0.312 (iii)
     TIME TO PEAK    (hrs)=     12.20        12.20       12.20
     RUNOFF VOLUME    (mm)=     81.45        38.50       65.98
     TOTAL RAINFALL   (mm)=     82.45        82.45       82.45
     RUNOFF COEFFICIENT   =      0.99         0.47        0.80

***** 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.
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-------------------
| DUHYD     (0089)|
| Inlet Cap.=0.350|
| #of Inlets=    1|
| Total(cms)=  0.3|      AREA     QPEAK     TPEAK     R.V.
-------------------      (ha)      (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.50      0.31     12.20    65.98
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   1.50      0.31     12.20    65.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| CALIB           |
| STANDHYD  (0113)|   Area    (ha)=   1.21
|ID= 1 DT=12.0 min|   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.67         0.54
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     92.20        50.35
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.17         0.07       0.237 (iii)
     TIME TO PEAK    (hrs)=     12.20        12.20       12.20
     RUNOFF VOLUME    (mm)=     81.45        38.50       62.12
     TOTAL RAINFALL   (mm)=     82.45        82.45       82.45
     RUNOFF COEFFICIENT   =      0.99         0.47        0.75

***** 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.
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-------------------
| CALIB           |
| STANDHYD  (0115)|   Area    (ha)=  17.98
|ID= 1 DT=12.0 min|   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     10.97         7.01
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     92.20        50.35
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      2.81         0.86       3.668 (iii)
     TIME TO PEAK    (hrs)=     12.20        12.20       12.20
     RUNOFF VOLUME    (mm)=     81.45        38.50       64.70
     TOTAL RAINFALL   (mm)=     82.45        82.45       82.45
     RUNOFF COEFFICIENT   =      0.99         0.47        0.78

***** 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.
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-------------------
| ADD HYD   (0112)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0113):     1.21    0.237    12.20    62.12
        + ID2= 2 (0114):     2.11    0.153    12.20    35.28
          ================================================
          ID = 3 (0112):     3.32    0.390    12.20    45.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

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-------------------
| ADD HYD   (0112)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 3 (0112):     3.32    0.390    12.20    45.06
        + ID2= 2 (0115):    17.98    3.668    12.20    64.70
          ================================================
          ID = 1 (0112):    21.30    4.058    12.20    61.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

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-------------------
| ADD HYD   (0112) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0112):    21.30    4.058    12.20    61.64
       + ID2= 2 (0084):    10.64    2.298    12.20    68.56
         ================================================
         ID = 3 (0112):    31.94    6.356    12.20    63.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------
| ADD HYD   (0112) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0112):    31.94    6.356    12.20    63.94
       + ID2= 2 (0085):     8.53    1.820    12.20    67.70
         ================================================
         ID = 1 (0112):    40.47    8.176    12.20    64.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------
| ADD HYD   (0112) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0089 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
         ID1= 1 (0112):    40.47    8.176    12.20    64.74
       + ID2= 2 (0089):     0.00    0.000     0.00     0.00
         ================================================
         ID = 3 (0112):    40.47    8.176    12.20    64.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------
| CALIB            |
| NASHYD    (0137) |   Area     (ha)=   1.33   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.391

     PEAK FLOW       (cms)=   0.128 (i)
     TIME TO PEAK    (hrs)=  12.200
     RUNOFF VOLUME    (mm)=  29.119
     TOTAL RAINFALL   (mm)=  82.446
     RUNOFF COEFFICIENT   =   0.353

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------
| CALIB            |
| STANDHYD  (0096) |   Area     (ha)=   3.62
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     1.01          2.61
     Dep. Storage     (mm)=     1.00          1.50
     Average Slope     (%)=     2.00          2.00
     Length            (m)=    30.00         20.00
     Mannings n            =    0.013         0.250

     Max.Eff.Inten.(mm/hr)=    92.20         50.35
               over (min)      12.00         12.00
     Storage Coeff.  (min)=     1.04 (ii)     7.17 (ii)
     Unit Hyd. Tpeak (min)=    12.00         12.00
     Unit Hyd. peak  (cms)=     0.14          0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.26          0.32       0.579 (iii)
     TIME TO PEAK    (hrs)=    12.20         12.20      12.20
     RUNOFF VOLUME    (mm)=    81.45         38.50      50.52
     TOTAL RAINFALL   (mm)=    82.45         82.45      82.45
     RUNOFF COEFFICIENT   =     0.99          0.47       0.61

***** 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  (0138) |   Area     (ha)=   1.45
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     0.93          0.52
     Dep. Storage     (mm)=     1.00          1.50
     Average Slope     (%)=     2.00          2.00
     Length            (m)=    30.00         20.00
     Mannings n            =    0.013         0.250

     Max.Eff.Inten.(mm/hr)=    92.20         50.35
               over (min)      12.00         12.00
     Storage Coeff.  (min)=     1.04 (ii)     7.17 (ii)
     Unit Hyd. Tpeak (min)=    12.00         12.00
     Unit Hyd. peak  (cms)=     0.14          0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.24          0.06       0.302 (iii)
     TIME TO PEAK    (hrs)=    12.20         12.20      12.20
     RUNOFF VOLUME    (mm)=    81.45         38.50      65.98
     TOTAL RAINFALL   (mm)=    82.45         82.45      82.45
     RUNOFF COEFFICIENT   =     0.99          0.47       0.80

***** 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   (0136) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0137):     1.33    0.128    12.20    29.12
       + ID2= 2 (0138):     1.45    0.302    12.20    65.98
         ================================================
         ID = 3 (0136):     2.78    0.429    12.20    48.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------
| ADD HYD   (0136) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0136):     2.78    0.429    12.20    48.35
       + ID2= 2 (0096):     3.62    0.579    12.20    50.52
         ================================================
         ID = 1 (0136):     6.40    1.008    12.20    49.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------
| RESERVOIR (0117) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |  0.3260      0.8017
                         0.0790     0.1850   |  0.3960      0.9004
                         0.2270     0.3947   |  0.0000      0.0000

                              AREA     QPEAK     TPEAK      R.V.
                              (ha)     (cms)     (hrs)      (mm)
     INFLOW : ID= 2 (0136)    6.400     1.008     12.20     49.58
     OUTFLOW: ID= 1 (0117)    6.400     0.074     13.10     49.49

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.33
                TIME SHIFT OF PEAK FLOW       (min)= 54.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.1732

-------------------
| ROUTE PIPE (0116)|     PIPE Number     =   1.00
```

| IN= 2---> OUT= 1 | Diameter (mm)=1650.00
| DT= 5.0 min | Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0117)	6.40	0.07	13.10	49.49	0.12	0.91
OUTFLOW: ID= 1 (0116)	6.40	0.07	13.40	49.48	0.12	0.91

| ADD HYD (0111) | 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	40.47	8.176	12.20	64.74
+ ID2= 2 (0116):	6.40	0.073	13.40	49.48
ID = 3 (0111):	46.87	8.205	12.20	62.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR (0110) | IN= 2---> OUT= 1 | DT= 5.0 min |

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.0010	1.0368
0.0410	0.1625	1.4640	1.1396
0.0970	0.4197	1.6230	1.3517
0.1600	0.6939	2.0260	2.0441
0.5090	0.8867	2.6870	2.2310
0.6570	0.9362	6.1640	2.6224

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0111)	46.870	8.205	12.20	62.67
OUTFLOW: ID= 1 (0110)	46.870	1.631	12.50	62.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.88
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 1.3673

| DUHYD (0144) | Inlet Cap.=2.787 | #of Inlets= 1 | Total(cms)= 2.8 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	46.87	1.63	12.50	62.65
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	46.87	1.63	12.50	62.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |

| STANDHYD (0081) | ID= 1 DT=12.0 min | Area (ha)= 1.34 | Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.00	0.34
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	92.20	50.35
over (min)	12.00	12.00
Storage Coeff. (min)=	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

			TOTALS
PEAK FLOW (cms)=	0.26	0.04	0.298 (iii)
TIME TO PEAK (hrs)=	12.20	12.20	12.20
RUNOFF VOLUME (mm)=	81.45	38.50	70.70
TOTAL RAINFALL (mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT =	0.99	0.47	0.86

***** 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 (0082) | ID= 1 DT=12.0 min | Area (ha)= 2.51 | Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.88	0.63
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	92.20	50.35
over (min)	12.00	12.00
Storage Coeff. (min)=	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

			TOTALS
PEAK FLOW (cms)=	0.48	0.08	0.559 (iii)
TIME TO PEAK (hrs)=	12.20	12.20	12.20
RUNOFF VOLUME (mm)=	81.45	38.50	70.71
TOTAL RAINFALL (mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT =	0.99	0.47	0.86

***** 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 (0101) | ID= 1 DT=12.0 min | Area (ha)= 0.47 | Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.33	0.14
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	92.20	50.35
over (min)	12.00	12.00
Storage Coeff. (min)=	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

			TOTALS
PEAK FLOW (cms)=	0.08	0.02	0.102 (iii)
TIME TO PEAK (hrs)=	12.20	12.20	12.20
RUNOFF VOLUME (mm)=	81.45	38.50	68.55
TOTAL RAINFALL (mm)=	82.45	82.45	82.45

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     RUNOFF COEFFICIENT   =       0.99         0.47          0.83

***** 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.

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-------------------
| ADD HYD   (0088) |
|   1 +  2 =  3    |
-------------------          AREA    QPEAK    TPEAK     R.V.
                              (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0101):     0.47   0.102    12.20    68.55
        + ID2= 2 (0082):     2.51   0.559    12.20    70.71
          ================================================
          ID = 3 (0088):     2.98   0.661    12.20    70.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| DUHYD     (0093) |
| Inlet Cap.=0.934 |
| #of Inlets=    1 |
| Total(cms)=  0.9 |       AREA     QPEAK     TPEAK    R.V.
-------------------        (ha)      (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   2.98       0.66     12.20   70.37
     ====================================================
     MAJOR SYS.(ID= 2):   0.00       0.00      0.00    0.00
     MINOR SYS.(ID= 3):   2.98       0.66     12.20   70.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB             |
| STANDHYD  (0094)  |    Area    (ha)=   2.25
|ID= 1 DT=12.0 min  |    Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.35         0.90
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.35         0.11      0.456 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20      12.20
     RUNOFF VOLUME    (mm)=      81.45        38.50      64.27
     TOTAL RAINFALL   (mm)=      82.45        82.45      82.45
     RUNOFF COEFFICIENT   =       0.99         0.47       0.78

***** 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.

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-------------------
| CALIB             |
| STANDHYD  (0100)  |    Area    (ha)=   1.27
|ID= 1 DT=12.0 min  |    Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.86         0.41
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.05      0.271 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20      12.20
     RUNOFF VOLUME    (mm)=      81.45        38.50      67.70
     TOTAL RAINFALL   (mm)=      82.45        82.45      82.45
     RUNOFF COEFFICIENT   =       0.99         0.47       0.82

***** 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.

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| DUHYD     (0092) |
| Inlet Cap.=0.309 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK    R.V.
-------------------        (ha)      (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   1.27       0.27     12.20   67.70
     ====================================================
     MAJOR SYS.(ID= 2):   0.00       0.00      0.00    0.00
     MINOR SYS.(ID= 3):   1.27       0.27     12.20   67.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB             |
| STANDHYD  (0102)  |    Area    (ha)=   2.71
|ID= 1 DT=12.0 min  |    Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.25      0.422 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20      12.20
     RUNOFF VOLUME    (mm)=      81.45        38.50      49.24
     TOTAL RAINFALL   (mm)=      82.45        82.45      82.45
     RUNOFF COEFFICIENT   =       0.99         0.47       0.60

***** 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.

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-------------------
| CALIB             |
| STANDHYD  (0103)  |    Area    (ha)=   5.86
|ID= 1 DT=12.0 min  |    Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.28         2.58
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.84         0.32      1.156 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20      12.20
     RUNOFF VOLUME    (mm)=      81.45        38.50      62.55
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     TOTAL RAINFALL   (mm)=      82.45        82.45          82.45
     RUNOFF COEFFICIENT   =       0.99         0.47           0.76

***** 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.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0102):     2.71   0.422    12.20    49.24
       + ID2= 2 (0103):     5.86   1.156    12.20    62.55
         ================================================
         ID = 3 (0104):     8.57   1.579    12.20    58.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0104):     8.57   1.579    12.20    58.34
       + ID2= 2 (0081):     1.34   0.298    12.20    70.70
         ================================================
         ID = 1 (0104):     9.91   1.877    12.20    60.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0092 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
         ID1= 1 (0104):     9.91   1.877    12.20    60.01
       + ID2= 2 (0092):     0.00   0.000     0.00     0.00
         ================================================
         ID = 3 (0104):     9.91   1.877    12.20    60.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0104):     9.91   1.877    12.20    60.01
       + ID2= 2 (0093):     2.98   0.661    12.20    70.37
         ================================================
         ID = 1 (0104):    12.89   2.538    12.20    62.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0104):    12.89   2.538    12.20    62.41
       + ID2= 2 (0094):     2.25   0.456    12.20    64.27
         ================================================
         ID = 3 (0104):    15.14   2.994    12.20    62.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0083) |   Area     (ha)=   3.28
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30         0.98
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.59         0.12          0.709 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20          12.20
     RUNOFF VOLUME    (mm)=      81.45        38.50          68.56
     TOTAL RAINFALL   (mm)=      82.45        82.45          82.45
     RUNOFF COEFFICIENT   =       0.99         0.47           0.83

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0091) |   Area     (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.38         1.12
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.35         0.14          0.490 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20          12.20
     RUNOFF VOLUME    (mm)=      81.45        38.50          62.12
     TOTAL RAINFALL   (mm)=      82.45        82.45          82.45
     RUNOFF COEFFICIENT   =       0.99         0.47           0.75

***** 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.

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| DUHYD     (0090) |
| Inlet Cap.=0.502 |
| #of Inlets=    1 |
| Total(cms)=  0.5 |       AREA     QPEAK     TPEAK    R.V.
--------------------          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):    2.50      0.49     12.20    62.12
     ================================================
     MAJOR SYS.(ID= 2):    0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):    2.50      0.49     12.20    62.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0109) |   Area     (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71         3.45
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250
```

```
     Max.Eff.Inten.(mm/hr)=      92.20        50.35
               over (min)        12.00        12.00
     Storage Coeff.  (min)=       1.04 (ii)    7.17 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=       1.72         0.42          2.140 (iii)
     TIME TO PEAK    (hrs)=      12.20        12.20         12.20
     RUNOFF VOLUME    (mm)=      81.45        38.50         66.84
     TOTAL RAINFALL   (mm)=      82.45        82.45         82.45
     RUNOFF COEFFICIENT   =       0.99         0.47          0.81

***** 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 (0107)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0109):	10.16	2.140	12.20	66.84
	+ ID2= 2 (0083):	3.28	0.709	12.20	68.56
	ID = 3 (0107):	13.44	2.849	12.20	67.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	13.44	2.849	12.20	67.26
	+ ID2= 2 (0089):	1.50	0.312	12.20	65.98
	ID = 1 (0107):	14.94	3.161	12.20	67.13

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0107):	14.94	3.161	12.20	67.13
	+ ID2= 2 (0090):	2.50	0.490	12.20	62.12
	ID = 3 (0107):	17.44	3.651	12.20	66.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	17.44	3.651	12.20	66.42
	+ ID2= 2 (0092):	1.27	0.271	12.20	67.70
	ID = 1 (0107):	18.71	3.922	12.20	66.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0106)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.7020	0.4603
0.0190	0.0734	1.0110	0.9685
0.0360	0.1913	1.0260	1.0011
0.0460	0.2976	1.1220	1.2435
0.5590	0.4360	0.0000	0.0000

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
     INFLOW : ID= 2 (0107)     18.710      3.922     12.20      66.50
     OUTFLOW: ID= 1 (0106)     18.710      0.807     12.40      66.45

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.59
                   TIME SHIFT OF PEAK FLOW          (min)= 12.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=  0.6342
```

ROUTE PIPE (0105)
IN= 2---> OUT= 1
DT= 5.0 min

```
     PIPE Number      =   1.00
     Diameter    (mm)=1650.00
     Length       (m)= 467.00
     Slope      (m/m)=  0.006
     Manning n        =  0.013
```

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<---- hydrograph ----> MAX DEPTH (m)	<-pipe / channel-> MAX VEL (m/s)
INFLOW : ID= 2 (0106)	18.71	0.81	12.40	66.45	0.37	2.18
OUTFLOW: ID= 1 (0105)	18.71	0.81	12.50	66.45	0.37	2.18

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0104):	15.14	2.994	12.20	62.68
	+ ID2= 2 (0105):	18.71	0.808	12.50	66.45
	ID = 3 (0099):	33.85	3.619	12.20	64.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)

```
*** W A R N I N G :  HYDROGRAPH 0144 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
```

	ID1= 3 (0099):	33.85	3.619	12.20	64.81
	+ ID2= 2 (0144):	0.00	0.000	0.00	0.00
	ID = 1 (0099):	33.85	3.619	12.20	64.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0098)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8190	1.9354
0.0200	0.0920	0.9260	2.5967
0.0480	0.2529	1.2030	3.3403
0.3020	0.3889	1.2340	3.4062
0.3520	0.4239	4.2880	3.6759
0.7390	1.5375	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0099)	33.850	3.619	12.20	64.81
OUTFLOW: ID= 1 (0098)	33.850	0.519	14.20	64.78

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.34
TIME SHIFT OF PEAK FLOW (min)=120.00
MAXIMUM STORAGE USED (ha.m.)= 0.9050

CALIB NASHYD (0123) ID= 1 DT=12.0 min | Area (ha)= 1.61 Curve Number (CN)= 74.0 | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.155 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 29.119
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.353

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB NASHYD (0124) ID= 1 DT=12.0 min | Area (ha)= 2.59 Curve Number (CN)= 74.0 | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.216 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 34.708
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.421

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0086) ID= 1 DT=12.0 min | Area (ha)= 10.18 | Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	7.63	2.55	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		92.20	50.35	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.96	0.31	2.267 (iii)
TIME TO PEAK	(hrs)=	12.20	12.20	12.20
RUNOFF VOLUME	(mm)=	81.45	38.50	70.71
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.47	0.86

***** 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 (0087) ID= 1 DT=12.0 min | Area (ha)= 2.21 | Total Imp(%)= 85.00 Dir. Conn.(%)= 85.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.88	0.33
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	50.35
over (min)		12.00	12.00
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12
			TOTALS
PEAK FLOW	(cms)=	0.48	0.04	0.522 (iii)
TIME TO PEAK	(hrs)=	12.20	12.20	12.20
RUNOFF VOLUME	(mm)=	81.45	38.50	75.00
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.47	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 (0097) ID= 1 DT=12.0 min | Area (ha)= 0.85 | Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.24	0.61	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		92.20	50.35	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.06	0.07	0.136 (iii)
TIME TO PEAK	(hrs)=	12.20	12.20	12.20
RUNOFF VOLUME	(mm)=	81.45	38.50	50.52
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.47	0.61

***** 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 (0125) ID= 1 DT=12.0 min | Area (ha)= 6.71 | Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	5.37	1.34	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		92.20	50.35	
over (min)		12.00	12.00	
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.37	0.16	1.539 (iii)
TIME TO PEAK	(hrs)=	12.20	12.20	12.20
RUNOFF VOLUME	(mm)=	81.45	38.50	72.86
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.47	0.88

***** 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 (0122)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0123):		1.61	0.155	12.20	29.12
+ ID2= 2 (0124):		2.59	0.216	12.20	34.71
ID = 3 (0122):		4.20	0.370	12.20	32.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0122):		4.20	0.370	12.20	32.57
+ ID2= 2 (0125):		6.71	1.539	12.20	72.86
ID = 1 (0122):		10.91	1.909	12.20	57.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0122):		10.91	1.909	12.20	57.35
+ ID2= 2 (0086):		10.18	2.267	12.20	70.71
ID = 3 (0122):		21.09	4.176	12.20	63.80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0122):		21.09	4.176	12.20	63.80
+ ID2= 2 (0087):		2.21	0.522	12.20	75.00
ID = 1 (0122):		23.30	4.698	12.20	64.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0122):		23.30	4.698	12.20	64.86
+ ID2= 2 (0097):		0.85	0.136	12.20	50.52
ID = 3 (0122):		24.15	4.834	12.20	64.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0120)	OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1	(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 12.0 min	0.0000	0.0000	0.1220	0.9070
	0.0340	0.1438	0.1360	1.1803
	0.0550	0.3009	0.1530	1.5887
	0.0860	0.4370	2.5850	1.7557
	0.0900	0.4726	10.7310	2.0518

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0122)	24.150	4.834	12.20	64.35
OUTFLOW: ID= 1 (0120)	24.150	0.130	16.20	64.31

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.69

TIME SHIFT OF PEAK FLOW (min)=240.00
MAXIMUM STORAGE USED (ha.m.)= 1.0628

CALIB					
NASHYD (0131)	Area	(ha)=	6.53	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)=	5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)=	0.19		

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.595 (i)
TIME TO PEAK (hrs)= 12.200
RUNOFF VOLUME (mm)= 33.872
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.411

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0128)	Area	(ha)=	2.34	
ID= 1 DT=12.0 min	Total Imp	(%)=	55.00	Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.29	1.05	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	92.20	50.35	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.33	0.13	0.459 (iii)
TIME TO PEAK	(hrs)=	12.20	12.20	12.20
RUNOFF VOLUME	(mm)=	81.45	38.50	62.12
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.47	0.75

***** 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 (0130)	Area	(ha)=	0.97	
ID= 1 DT=12.0 min	Total Imp	(%)=	64.00	Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.62	0.35	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	92.20	50.35	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	1.04 (ii)	7.17 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.16	0.04	0.202 (iii)
TIME TO PEAK	(hrs)=	12.20	12.20	12.20
RUNOFF VOLUME	(mm)=	81.45	38.50	65.98
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.47	0.80

***** 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.

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| ADD HYD   (0129) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0128):     2.34   0.459    12.20    62.12
       + ID2= 2 (0130):     0.97   0.202    12.20    65.98
         ================================================
         ID = 3 (0129):     3.31   0.660    12.20    63.25

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0129) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0129):     3.31   0.660    12.20    63.25
       + ID2= 2 (0131):     6.53   0.595    12.20    33.87
         ================================================
         ID = 1 (0129):     9.84   1.255    12.20    43.75

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB             |
| NASHYD    (0134)  |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

    Unit Hyd Qpeak  (cms)=   0.204

    PEAK FLOW       (cms)=   0.087 (i)
    TIME TO PEAK    (hrs)=  12.200
    RUNOFF VOLUME    (mm)=  32.935
    TOTAL RAINFALL   (mm)=  82.446
    RUNOFF COEFFICIENT   =   0.399

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB             |
| STANDHYD  (0095)  |   Area     (ha)=   2.95
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
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                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      0.74         2.21
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=     92.20        50.35
          over (min)     =     12.00        12.00
    Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=      0.19         0.27          0.460 (iii)
    TIME TO PEAK    (hrs)=     12.20        12.20          12.20
    RUNOFF VOLUME    (mm)=     81.45        38.50          49.24
    TOTAL RAINFALL   (mm)=     82.45        82.45          82.45
    RUNOFF COEFFICIENT   =      0.99         0.47           0.60

***** 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.

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| CALIB             |
| STANDHYD  (0133)  |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min  |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
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                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      4.18         2.68
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=     92.20        50.35
          over (min)     =     12.00        12.00
    Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=      1.07         0.33          1.399 (iii)
    TIME TO PEAK    (hrs)=     12.20        12.20          12.20
    RUNOFF VOLUME    (mm)=     81.45        38.50          64.70
    TOTAL RAINFALL   (mm)=     82.45        82.45          82.45
    RUNOFF COEFFICIENT   =      0.99         0.47           0.78

***** 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.

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| CALIB             |
| STANDHYD  (0135)  |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min  |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
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                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      2.36         1.51
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=     92.20        50.35
          over (min)     =     12.00        12.00
    Storage Coeff.  (min)=      1.04 (ii)    7.17 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=      0.60         0.18          0.789 (iii)
    TIME TO PEAK    (hrs)=     12.20        12.20          12.20
    RUNOFF VOLUME    (mm)=     81.45        38.50          64.70
    TOTAL RAINFALL   (mm)=     82.45        82.45          82.45
    RUNOFF COEFFICIENT   =      0.99         0.47           0.78

***** 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.

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| ADD HYD   (0132) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 1 (0133):     6.86   1.399    12.20    64.70
       + ID2= 2 (0134):     0.91   0.087    12.20    32.93
         ================================================
         ID = 3 (0132):     7.77   1.486    12.20    60.98

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0132) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)     (mm)
         ID1= 3 (0132):     7.77   1.486    12.20    60.98
       + ID2= 2 (0135):     3.87   0.789    12.20    64.70
         ================================================
         ID = 1 (0132):    11.64   2.276    12.20    62.21

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0132) |
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1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0132):	11.64	2.276	12.20	62.21
+ ID2= 2 (0095):	2.95	0.460	12.20	49.24
ID = 3 (0132):	14.59	2.735	12.20	59.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0127)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0132)	14.590	2.735	12.20	59.59
OUTFLOW: ID= 1 (0127)	14.590	0.535	12.50	59.57

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.58
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.3581

ROUTE PIPE (0119)
IN= 2---> OUT= 1
DT= 12.0 min

Pipe Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.54	12.50	59.57	0.32	1.80
OUTFLOW: ID= 1 (0119)	14.59	0.54	12.50	59.57	0.32	1.80

ADD HYD (0118)
1 + 2 = 3

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0119):	14.59	0.536	12.50	59.57
+ ID2= 2 (0129):	9.84	1.255	12.20	43.75
ID = 3 (0118):	24.43	1.624	12.20	53.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126)
IN= 2---> OUT= 1
DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	1.624	12.20	53.24
OUTFLOW: ID= 1 (0126)	24.430	0.506	13.60	53.24

PEAK FLOW REDUCTION [Qout/Qin](%)= 31.19
TIME SHIFT OF PEAK FLOW (min)= 84.00
MAXIMUM STORAGE USED (ha.m.)= 0.3083

ADD HYD (0155)
1 + 2 = 3

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0120):	24.15	0.130	16.20	64.31
+ ID2= 2 (0126):	24.43	0.506	13.60	53.24
ID = 3 (0155):	48.58	0.634	13.60	58.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0147)
ID= 1 DT= 5.0 min

Area (ha)= 1.49 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76

4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.117 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 35.935
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.436

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0146) ID= 1 DT= 5.0 min | Area (ha)= 2.59 Total Imp(%)= 44.00 Dir. Conn.(%)= 44.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.14	1.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	30.00
Length	(m)=	20.75	10.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		92.20	49.42
over (min)		5.00	5.00
Storage Coeff. (min)=		0.83 (ii)	2.39 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.34	0.30

		TOTALS
PEAK FLOW	(cms)=	0.29 0.20 0.496 (iii)
TIME TO PEAK	(hrs)=	12.17 12.17 12.17
RUNOFF VOLUME	(mm)=	81.45 38.50 57.40
TOTAL RAINFALL	(mm)=	82.45 82.45 82.45
RUNOFF COEFFICIENT	=	0.99 0.47 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 (0148) 1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0146):		2.59	0.496	12.17	57.40
+ ID2= 2 (0147):		1.49	0.117	12.33	35.93
ID = 3 (0148):		4.07	0.589	12.17	49.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0148) 3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0148):		4.07	0.589	12.17	49.57
+ ID2= 2 (0155):		48.58	0.634	13.60	58.74
ID = 1 (0148):		52.65	1.015	12.17	58.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION NUMBER: 4 **

READ STORM Ptotal= 95.96 mm | Filename: C:\Users\DMcBrayne\AppData\Local\Temp\99de1fdc-d6ae-4e6e-b844-585c8b2021ad\05dd739c
Comments: TWENTYFIVE YR SCS STORM WITH A TWELVE MI

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	1.02	6.20	2.03	12.20	18.80	18.20	2.03
0.40	1.02	6.40	2.03	12.40	11.68	18.40	2.03
0.60	1.02	6.60	2.03	12.60	8.38	18.60	2.03
0.80	1.02	6.80	2.03	12.80	8.13	18.80	2.03
1.00	1.02	7.00	2.03	13.00	5.59	19.00	2.03
1.20	1.02	7.20	2.03	13.20	4.83	19.20	1.52
1.40	1.02	7.40	2.03	13.40	4.83	19.40	1.52
1.60	1.02	7.60	2.03	13.60	4.83	19.60	1.52
1.80	1.02	7.80	2.03	13.80	4.83	19.80	1.52
2.00	1.02	8.00	2.03	14.00	4.83	20.00	1.52
2.20	1.02	8.20	2.79	14.20	2.79	20.20	1.52
2.40	1.02	8.40	2.79	14.40	2.79	20.40	1.52
2.60	1.02	8.60	2.79	14.60	2.79	20.60	1.52
2.80	1.02	8.80	2.79	14.80	2.79	20.80	1.52
3.00	1.02	9.00	2.79	15.00	2.79	21.00	1.52
3.20	1.02	9.20	2.79	15.20	2.79	21.20	1.02
3.40	1.02	9.40	2.79	15.40	2.79	21.40	1.02
3.60	1.02	9.60	2.79	15.60	2.79	21.60	1.02
3.80	1.02	9.80	2.79	15.80	2.79	21.80	1.02
4.00	1.02	10.00	2.79	16.00	2.79	22.00	1.02
4.20	2.03	10.20	5.08	16.20	2.03	22.20	1.02
4.40	2.03	10.40	5.08	16.40	2.03	22.40	1.02
4.60	2.03	10.60	5.08	16.60	2.03	22.60	1.02
4.80	2.03	10.80	5.08	16.80	2.03	22.80	1.02
5.00	2.03	11.00	5.08	17.00	2.03	23.00	1.02
5.20	2.03	11.20	7.11	17.20	2.03	23.20	1.02
5.40	2.03	11.40	10.41	17.40	2.03	23.40	1.02
5.60	2.03	11.60	23.37	17.60	2.03	23.60	1.02
5.80	2.03	11.80	51.56	17.80	2.03	23.80	1.02
6.00	2.03	12.00	107.44	18.00	2.03	24.00	1.02

CALIB NASHYD (0114) ID= 1 DT=12.0 min | Area (ha)= 2.11 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.196 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 45.021
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.469

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0084) ID= 1 DT=12.0 min | Area (ha)= 10.64 Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	7.45	3.19
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		107.44	63.42
over (min)		12.00	12.00
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)

```
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       2.22         0.50          2.726 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57         81.04
     TOTAL RAINFALL   (mm)=      95.96        95.96         95.96
     RUNOFF COEFFICIENT   =       0.99         0.51          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.

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--------------------
| CALIB                |
| STANDHYD  (0085)     |   Area     (ha)=   8.53
|ID= 1 DT=12.0 min     |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.80         2.73
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       1.73         0.43          2.162 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57         80.12
     TOTAL RAINFALL   (mm)=      95.96        95.96         95.96
     RUNOFF COEFFICIENT   =       0.99         0.51          0.83

***** 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.

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--------------------
| CALIB                |
| STANDHYD  (0108)     |   Area     (ha)=   1.50
|ID= 1 DT=12.0 min     |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.96         0.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.09          0.372 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57         78.26
     TOTAL RAINFALL   (mm)=      95.96        95.96         95.96
     RUNOFF COEFFICIENT   =       0.99         0.51          0.82

***** 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.

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--------------------
| DUHYD     (0089)     |
| Inlet Cap.=0.350     |
| #of Inlets=    1     |
| Total(cms)=  0.3     |
--------------------
                           AREA     QPEAK     TPEAK     R.V.
                            (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):    1.50      0.37     12.00    78.26
     ==========================================================
     MAJOR SYS.(ID= 2):    0.02      0.02     12.00    78.26
     MINOR SYS.(ID= 3):    1.48      0.35     12.00    78.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB                |
| STANDHYD  (0113)     |   Area     (ha)=   1.21
|ID= 1 DT=12.0 min     |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.67         0.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.20         0.09          0.285 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57         74.08
     TOTAL RAINFALL   (mm)=      95.96        95.96         95.96
     RUNOFF COEFFICIENT   =       0.99         0.51          0.77

***** 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.

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--------------------
| CALIB                |
| STANDHYD  (0115)     |   Area     (ha)=  17.98
|ID= 1 DT=12.0 min     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.97         7.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       3.27         1.11          4.380 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57         76.87
     TOTAL RAINFALL   (mm)=      95.96        95.96         95.96
     RUNOFF COEFFICIENT   =       0.99         0.51          0.80

***** 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.

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--------------------
| ADD HYD   (0112)     |
|   1 +  2 =  3        |          AREA    QPEAK    TPEAK     R.V.
--------------------      (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0113):     1.21   0.285    12.00    74.08
        + ID2= 2 (0114):     2.11   0.196    12.00    45.02
          ================================================
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          ID = 3 (0112):     3.32   0.480    12.00    55.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0112) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0112):     3.32   0.480    12.00    55.61
        + ID2= 2 (0115):    17.98   4.380    12.00    76.87
          ================================================
          ID = 1 (0112):    21.30   4.860    12.00    73.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0112) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0112):    21.30   4.860    12.00    73.56
        + ID2= 2 (0084):    10.64   2.726    12.00    81.04
          ================================================
          ID = 3 (0112):    31.94   7.586    12.00    76.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0112) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0112):    31.94   7.586    12.00    76.05
        + ID2= 2 (0085):     8.53   2.162    12.00    80.12
          ================================================
          ID = 1 (0112):    40.47   9.748    12.00    76.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0112) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0112):    40.47   9.748    12.00    76.91
        + ID2= 2 (0089):     0.02   0.022    12.00    78.26
          ================================================
          ID = 3 (0112):    40.49   9.770    12.00    76.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB             |
| NASHYD    (0137)  |   Area     (ha)=   1.33   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min  |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.391

     PEAK FLOW       (cms)=   0.163 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  37.157
     TOTAL RAINFALL   (mm)=  95.961
     RUNOFF COEFFICIENT   =   0.387

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB             |
| STANDHYD  (0096)  |   Area     (ha)=   3.62
|ID= 1 DT=12.0 min  |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    1.01          2.61
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=   30.00         20.00
     Mannings n           =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=  107.44         63.42
               over (min)       12.00         12.00
     Storage Coeff.  (min)=    0.98 (ii)     6.57 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=    0.30          0.41          0.714 (iii)
     TIME TO PEAK    (hrs)=   12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=   94.96         48.57         61.56
     TOTAL RAINFALL   (mm)=   95.96         95.96         95.96
     RUNOFF COEFFICIENT   =    0.99          0.51          0.64

***** 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.

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-------------------
| CALIB             |
| STANDHYD  (0138)  |   Area     (ha)=   1.45
|ID= 1 DT=12.0 min  |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=    0.93          0.52
     Dep. Storage     (mm)=    1.00          1.50
     Average Slope     (%)=    2.00          2.00
     Length            (m)=   30.00         20.00
     Mannings n           =   0.013         0.250

     Max.Eff.Inten.(mm/hr)=  107.44         63.42
               over (min)       12.00         12.00
     Storage Coeff.  (min)=    0.98 (ii)     6.57 (ii)
     Unit Hyd. Tpeak (min)=   12.00         12.00
     Unit Hyd. peak  (cms)=    0.14          0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=    0.28          0.08          0.359 (iii)
     TIME TO PEAK    (hrs)=   12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=   94.96         48.57         78.26
     TOTAL RAINFALL   (mm)=   95.96         95.96         95.96
     RUNOFF COEFFICIENT   =    0.99          0.51          0.82

***** 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.

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| ADD HYD   (0136) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0137):     1.33   0.163    12.00    37.16
        + ID2= 2 (0138):     1.45   0.359    12.00    78.26
          ================================================
          ID = 3 (0136):     2.78   0.522    12.00    58.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0136) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0136):     2.78   0.522    12.00    58.60
        + ID2= 2 (0096):     3.62   0.714    12.00    61.56
          ================================================
          ID = 1 (0136):     6.40   1.236    12.00    60.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0117) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                        0.0000     0.0000    |  0.3260     0.8017
```

0.0790	0.1850	0.3960	0.9004
0.2270	0.3947	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0136)	6.400	1.236	12.00	60.27
OUTFLOW: ID= 1 (0117)	6.400	0.096	12.90	60.18

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.74
TIME SHIFT OF PEAK FLOW (min)= 54.00
MAXIMUM STORAGE USED (ha.m.)= 0.2086

ROUTE PIPE (0116)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 850.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.367E+02	0.0	0.80	17.68
0.17	.102E+03	0.1	1.25	11.33
0.26	.184E+03	0.3	1.61	8.81
0.35	.278E+03	0.6	1.91	7.41
0.43	.382E+03	1.0	2.18	6.51
0.52	.492E+03	1.4	2.41	5.88
0.61	.608E+03	1.9	2.61	5.43
0.69	.727E+03	2.4	2.79	5.08
0.78	.848E+03	2.9	2.95	4.81
0.87	.970E+03	3.5	3.08	4.60
0.96	.109E+04	4.1	3.20	4.43
1.04	.121E+04	4.7	3.29	4.31
1.13	.133E+04	5.2	3.36	4.22
1.22	.144E+04	5.8	3.41	4.15
1.30	.154E+04	6.2	3.44	4.12
1.39	.163E+04	6.6	3.43	4.13
1.48	.172E+04	6.9	3.40	4.17
1.56	.178E+04	6.9	3.31	4.28
1.65	.182E+04	6.5	3.02	4.70

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0117)	6.40	0.10	12.90	60.18	0.13	0.99
OUTFLOW: ID= 1 (0116)	6.40	0.09	13.10	60.18	0.13	0.98

ADD HYD (0111)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	40.49	9.770	12.00	76.91
+ ID2= 2 (0116):	6.40	0.095	13.10	60.18
ID = 3 (0111):	46.89	9.805	12.00	74.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0110)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.0010	1.0368
0.0410	0.1625	1.4640	1.1396
0.0970	0.4197	1.6230	1.3517
0.1600	0.6939	2.0260	2.0441
0.5090	0.8867	2.6870	2.2310
0.6570	0.9362	6.1640	2.6224

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0111)	46.890	9.805	12.00	74.65
OUTFLOW: ID= 1 (0110)	46.890	1.774	12.30	74.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.09
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 1.6114

DUHYD (0144)
Inlet Cap.=2.787
#of Inlets= 1
Total(cms)= 2.8

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	46.89	1.77	12.30	74.63
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	46.89	1.77	12.30	74.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0081)
ID= 1 DT=12.0 min

Area (ha)= 1.34
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.00	0.34	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	107.44	63.42	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.30	0.05	0.353 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	83.36
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	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 (0082)
ID= 1 DT=12.0 min

Area (ha)= 2.51
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.88	0.63	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	107.44	63.42	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.56	0.10	0.661 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	83.36
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	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 (0101)
ID= 1 DT=12.0 min

Area (ha)= 0.47
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.33	0.14

```
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.02          0.120 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57          81.04
     TOTAL RAINFALL   (mm)=      95.96        95.96          95.96
     RUNOFF COEFFICIENT   =       0.99         0.51           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.

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-------------------
| ADD HYD   (0088) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0101):     0.47   0.120    12.00     81.04
        + ID2= 2 (0082):     2.51   0.661    12.00     83.36
          ================================================
          ID = 3 (0088):     2.98   0.781    12.00     83.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| DUHYD     (0093) |
| Inlet Cap.=0.934 |
| #of Inlets=    1 |
| Total(cms)=  0.9 |       AREA     QPEAK     TPEAK     R.V.
-------------------        (ha)      (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   2.98       0.78     12.00    83.00
     ====================================================
     MAJOR SYS.(ID= 2):   0.00       0.00      0.00     0.00
     MINOR SYS.(ID= 3):   2.98       0.78     12.00    83.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0094) |   Area    (ha)=   2.25
|ID= 1 DT=12.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.35         0.90
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.40         0.14          0.545 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57          76.40
     TOTAL RAINFALL   (mm)=      95.96        95.96          95.96
     RUNOFF COEFFICIENT   =       0.99         0.51           0.80

***** 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.

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-------------------
| CALIB            |
| STANDHYD  (0100) |   Area    (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.86         0.41
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.06          0.322 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57          80.12
     TOTAL RAINFALL   (mm)=      95.96        95.96          95.96
     RUNOFF COEFFICIENT   =       0.99         0.51           0.83

***** 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.

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-------------------
| DUHYD     (0092) |
| Inlet Cap.=0.309 |
| #of Inlets=    1 |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK     R.V.
-------------------        (ha)      (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.27       0.32     12.00    80.12
     ====================================================
     MAJOR SYS.(ID= 2):   0.01       0.01     12.00    80.12
     MINOR SYS.(ID= 3):   1.26       0.31     12.00    80.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| STANDHYD  (0102) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         2.03
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.44        63.42
               over (min)       12.00        12.00
     Storage Coeff.  (min)=       0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.20         0.32          0.523 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      94.96        48.57          60.17
     TOTAL RAINFALL   (mm)=      95.96        95.96          95.96
     RUNOFF COEFFICIENT   =       0.99         0.51           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.

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-------------------
| CALIB            |
| STANDHYD  (0103) |   Area    (ha)=   5.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
```

Surface Area	(ha)=	3.28	2.58	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		107.44	63.42	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.98	0.41	1.386 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	74.55
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	0.78

***** 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 (0104)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	2.71	0.523	12.00	60.17
+ ID2= 2 (0103):	5.86	1.386	12.00	74.55
ID = 3 (0104):	8.57	1.909	12.00	70.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0104):	8.57	1.909	12.00	70.00
+ ID2= 2 (0081):	1.34	0.353	12.00	83.36
ID = 1 (0104):	9.91	2.262	12.00	71.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0104):	9.91	2.262	12.00	71.81
+ ID2= 2 (0092):	0.01	0.013	12.00	80.12
ID = 3 (0104):	9.92	2.275	12.00	71.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0104):	9.92	2.275	12.00	71.82
+ ID2= 2 (0093):	2.98	0.781	12.00	83.00
ID = 1 (0104):	12.90	3.056	12.00	74.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0104):	12.90	3.056	12.00	74.40
+ ID2= 2 (0094):	2.25	0.545	12.00	76.40
ID = 3 (0104):	15.15	3.601	12.00	74.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0083)
ID= 1 DT=12.0 min

Area (ha)= 3.28
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.30	0.98	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		107.44	63.42	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.69	0.16	0.840 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	81.04
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	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 (0091)
ID= 1 DT=12.0 min

Area (ha)= 2.50
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.38	1.12	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		107.44	63.42	
over (min)		12.00	12.00	
Storage Coeff. (min)=		0.98 (ii)	6.57 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.41	0.18	0.588 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	74.08
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	0.77

***** 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.

DUHYD (0090)
Inlet Cap.=0.502
#of Inlets= 1
Total(cms)= 0.5

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.50	0.59	12.00	74.08
MAJOR SYS.(ID= 2):	0.08	0.09	12.00	74.08
MINOR SYS.(ID= 3):	2.42	0.50	12.00	74.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0109)|   Area    (ha)=  10.16
|ID= 1 DT=12.0 min|   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      6.71         3.45
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    107.44        63.42
           over (min)          12.00        12.00
     Storage Coeff.  (min)=     0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=    12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     2.00         0.54      2.546 (iii)
     TIME TO PEAK    (hrs)=    12.00        12.00      12.00
     RUNOFF VOLUME    (mm)=    94.96        48.57      79.19
     TOTAL RAINFALL   (mm)=    95.96        95.96      95.96
     RUNOFF COEFFICIENT   =     0.99         0.51       0.83

***** 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   (0107)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0109):    10.16   2.546    12.00    79.19
       + ID2= 2 (0083):     3.28   0.840    12.00    81.04
         ================================================
         ID = 3 (0107):    13.44   3.387    12.00    79.64

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD   (0107)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0107):    13.44   3.387    12.00    79.64
       + ID2= 2 (0089):     1.48   0.350    12.00    78.26
         ================================================
         ID = 1 (0107):    14.92   3.737    12.00    79.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| ADD HYD   (0107)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0107):    14.92   3.737    12.00    79.50
       + ID2= 2 (0090):     2.42   0.502    12.00    74.08
         ================================================
         ID = 3 (0107):    17.34   4.239    12.00    78.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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-------------------
| ADD HYD   (0107)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0107):    17.34   4.239    12.00    78.75
       + ID2= 2 (0092):     1.26   0.309    12.00    80.12
         ================================================
         ID = 1 (0107):    18.60   4.548    12.00    78.84

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| RESERVOIR (0106)|
| IN= 2---> OUT= 1|
| DT=  5.0 min    |      OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |  0.7020      0.4603
                          0.0190     0.0734    |  1.0110      0.9685
                          0.0360     0.1913    |  1.0260      1.0011
                          0.0460     0.2976    |  1.1220      1.2435
                          0.5590     0.4360    |  0.0000      0.0000

                                    AREA     QPEAK     TPEAK       R.V.
                                     (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0107)      18.595     4.548     12.00       78.84
     OUTFLOW: ID= 1 (0106)      18.595     0.868     12.30       78.79

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 19.09
                   TIME SHIFT OF PEAK FLOW          (min)= 18.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=  0.7348
```

```
-------------------
| ROUTE PIPE (0105)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 467.00
-------------------      Slope      (m/m)=  0.006
                         Manning n        =  0.013

     <------------------ TRAVEL TIME TABLE ---------------------->
       DEPTH      VOLUME     FLOW RATE     VELOCITY     TRAV.TIME
         (m)     (cu.m.)       (cms)        (m/s)         min
        0.09    .201E+02         0.0         0.88          8.87
        0.17    .560E+02         0.2         1.37          5.68
        0.26    .101E+03         0.4         1.76          4.42
        0.35    .153E+03         0.7         2.09          3.72
        0.43    .210E+03         1.1         2.38          3.27
        0.52    .270E+03         1.5         2.64          2.95
        0.61    .334E+03         2.0         2.86          2.72
        0.69    .399E+03         2.6         3.06          2.55
        0.78    .466E+03         3.2         3.23          2.41
        0.87    .533E+03         3.9         3.38          2.31
        0.96    .599E+03         4.5         3.50          2.22
        1.04    .665E+03         5.1         3.60          2.16
        1.13    .728E+03         5.7         3.68          2.11
        1.22    .789E+03         6.3         3.74          2.08
        1.30    .846E+03         6.8         3.76          2.07
        1.39    .897E+03         7.2         3.76          2.07
        1.48    .943E+03         7.5         3.72          2.09
        1.56    .978E+03         7.6         3.63          2.15
        1.65    .999E+03         7.1         3.30          2.36
                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                 (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0106)   18.60     0.87   12.30  78.79       0.39       2.22
     OUTFLOW: ID= 1 (0105)   18.60     0.87   12.30  78.79       0.39       2.22
```

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-------------------
| ADD HYD   (0099)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0104):    15.15   3.601    12.00    74.70
       + ID2= 2 (0105):    18.60   0.870    12.30    78.79
         ================================================
         ID = 3 (0099):    33.75   4.371    12.00    77.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

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-------------------
| ADD HYD   (0099)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0144 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
         ID1= 3 (0099):    33.75   4.371    12.00    77.00
       + ID2= 2 (0144):     0.00   0.000     0.00     0.00
         ================================================
         ID = 1 (0099):    33.75   4.371    12.00    77.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
-------------------
| RESERVOIR (0098) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |
-------------------
```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8190	1.9354
0.0200	0.0920	0.9260	2.5967
0.0480	0.2529	1.2030	3.3403
0.3020	0.3889	1.2340	3.4062
0.3520	0.4239	4.2880	3.6759
0.7390	1.5375	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0099)	33.747	4.371	12.00	77.00
OUTFLOW: ID= 1 (0098)	33.747	0.589	14.30	76.97

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.47
TIME SHIFT OF PEAK FLOW (min)=138.00
MAXIMUM STORAGE USED (ha.m.)= 1.1055

```
-------------------
| CALIB            |
| NASHYD    (0123) |   Area     (ha)=   1.61   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13
```

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.197 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 37.157
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.387

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-------------------
| CALIB            |
| NASHYD    (0124) |   Area     (ha)=   2.59   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22
```

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.276 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 44.289
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.462

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-------------------
| CALIB            |
| STANDHYD  (0086) |   Area     (ha)=  10.18
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	7.63	2.55
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	107.44	63.42
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	2.680 (iii)
TIME TO PEAK	(hrs)=	12.00
RUNOFF VOLUME	(mm)=	83.36
TOTAL RAINFALL	(mm)=	95.96
RUNOFF COEFFICIENT	=	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  (0087) |   Area     (ha)=   2.21
|ID= 1 DT=12.0 min |   Total Imp(%)=  85.00   Dir. Conn.(%)=  85.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.88	0.33
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	107.44	63.42
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.613 (iii)
TIME TO PEAK	(hrs)=	12.00
RUNOFF VOLUME	(mm)=	88.00
TOTAL RAINFALL	(mm)=	95.96
RUNOFF COEFFICIENT	=	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  (0097) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	107.44	63.42
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.168 (iii)
TIME TO PEAK	(hrs)=	12.00
RUNOFF VOLUME	(mm)=	61.56
TOTAL RAINFALL	(mm)=	95.96
RUNOFF COEFFICIENT	=	0.64

***** 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  (0125) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	5.37	1.34
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	107.44	63.42
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	1.60	0.21	1.814 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	85.68
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	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.

ADD HYD (0122) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0123):	1.61	0.197	12.00	37.16
+ ID2= 2 (0124):	2.59	0.276	12.00	44.29
ID = 3 (0122):	4.20	0.473	12.00	41.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122) | 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0122):	4.20	0.473	12.00	41.55
+ ID2= 2 (0125):	6.71	1.814	12.00	85.68
ID = 1 (0122):	10.91	2.286	12.00	68.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0122):	10.91	2.286	12.00	68.69
+ ID2= 2 (0086):	10.18	2.680	12.00	83.36
ID = 3 (0122):	21.09	4.967	12.00	75.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122) | 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0122):	21.09	4.967	12.00	75.78
+ ID2= 2 (0087):	2.21	0.613	12.00	88.00
ID = 1 (0122):	23.30	5.580	12.00	76.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0122):	23.30	5.580	12.00	76.94
+ ID2= 2 (0097):	0.85	0.168	12.00	61.56
ID = 3 (0122):	24.15	5.747	12.00	76.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0120) | IN= 2---> OUT= 1 | DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1220	0.9070
0.0340	0.1438	0.1360	1.1803
0.0550	0.3009	0.1530	1.5887
0.0860	0.4370	2.5850	1.7557
0.0900	0.4726	10.7310	2.0518

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0122)	24.150	5.747	12.00	76.39
OUTFLOW: ID= 1 (0120)	24.150	0.140	16.20	76.35

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.43
TIME SHIFT OF PEAK FLOW (min)=252.00
MAXIMUM STORAGE USED (ha.m.)= 1.2736

CALIB | NASHYD (0131) | ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.760 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 43.221
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.450

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0128) | ID= 1 DT=12.0 min

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	107.44	63.42
over (min)		12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.38	0.17	0.550 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	94.96	48.57	74.08
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.51	0.77

***** 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 (0130) | ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	107.44	63.42
over (min)		12.00	12.00
Storage Coeff.	(min)=	0.98 (ii)	6.57 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.19	0.06	0.240 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00

```
     RUNOFF VOLUME     (mm)=      94.96        48.57          78.26
     TOTAL RAINFALL    (mm)=      95.96        95.96          95.96
     RUNOFF COEFFICIENT   =       0.99         0.51           0.82

***** 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.

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| ADD HYD   (0129) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)      (mm)
         ID1= 1 (0128):      2.34    0.550    12.00     74.08
       + ID2= 2 (0130):      0.97    0.240    12.00     78.26
         ================================================
         ID = 3 (0129):      3.31    0.791    12.00     75.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0129) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)      (mm)
         ID1= 3 (0129):      3.31    0.791    12.00     75.31
       + ID2= 2 (0131):      6.53    0.760    12.00     43.22
         ================================================
         ID = 1 (0129):      9.84    1.550    12.00     54.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB            |
| NASHYD    (0134) |   Area     (ha)=   0.91   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=    0.204

     PEAK FLOW       (cms)=    0.111 (i)
     TIME TO PEAK    (hrs)=   12.000
     RUNOFF VOLUME    (mm)=   42.025
     TOTAL RAINFALL   (mm)=   95.961
     RUNOFF COEFFICIENT   =    0.438

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| STANDHYD  (0095) |   Area     (ha)=   2.95
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.74         2.21
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    107.44        63.42
                 over (min)     12.00        12.00
     Storage Coeff.  (min)=     0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     0.22         0.35          0.569 (iii)
     TIME TO PEAK    (hrs)=    12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=    94.96        48.57          60.17
     TOTAL RAINFALL   (mm)=    95.96        95.96          95.96
     RUNOFF COEFFICIENT   =     0.99         0.51           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.

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-------------------
| CALIB            |
| STANDHYD  (0133) |   Area     (ha)=   6.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.18         2.68
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    107.44        63.42
                 over (min)     12.00        12.00
     Storage Coeff.  (min)=     0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     1.25         0.42          1.671 (iii)
     TIME TO PEAK    (hrs)=    12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=    94.96        48.57          76.87
     TOTAL RAINFALL   (mm)=    95.96        95.96          95.96
     RUNOFF COEFFICIENT   =     0.99         0.51           0.80

***** 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.

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| CALIB            |
| STANDHYD  (0135) |   Area     (ha)=   3.87
|ID= 1 DT=12.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.36         1.51
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    107.44        63.42
                 over (min)     12.00        12.00
     Storage Coeff.  (min)=     0.98 (ii)    6.57 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=     0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     0.70         0.24          0.943 (iii)
     TIME TO PEAK    (hrs)=    12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=    94.96        48.57          76.87
     TOTAL RAINFALL   (mm)=    95.96        95.96          95.96
     RUNOFF COEFFICIENT   =     0.99         0.51           0.80

***** 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.

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| ADD HYD   (0132) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)     (cms)    (hrs)      (mm)
         ID1= 1 (0133):      6.86    1.671    12.00     76.87
       + ID2= 2 (0134):      0.91    0.111    12.00     42.03
         ================================================
         ID = 3 (0132):      7.77    1.782    12.00     72.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0132) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
```

	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0132):	7.77	1.782	12.00	72.79
+ ID2= 2 (0135):	3.87	0.943	12.00	76.87
ID = 1 (0132):	11.64	2.724	12.00	74.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0132):	11.64	2.724	12.00	74.14
+ ID2= 2 (0095):	2.95	0.569	12.00	60.17
ID = 3 (0132):	14.59	3.294	12.00	71.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0127) | IN= 2---> OUT= 1 | DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0132)	14.590	3.294	12.00	71.32
OUTFLOW: ID= 1 (0127)	14.590	0.619	12.30	71.30

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.80
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.4292

ROUTE PIPE (0119) | IN= 2---> OUT= 1 | DT= 12.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.62	12.30	71.30	0.35	1.90
OUTFLOW: ID= 1 (0119)	14.59	0.62	12.30	71.30	0.35	1.90

ADD HYD (0118) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0119):	14.59	0.621	12.30	71.30
+ ID2= 2 (0129):	9.84	1.550	12.00	54.01
ID = 3 (0118):	24.43	1.981	12.00	64.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126) | IN= 2---> OUT= 1 | DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	1.981	12.00	64.39
OUTFLOW: ID= 1 (0126)	24.430	0.579	13.50	64.38

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.23
TIME SHIFT OF PEAK FLOW (min)= 90.00
MAXIMUM STORAGE USED (ha.m.)= 0.3827

ADD HYD (0155) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0120):	24.15	0.140	16.20	76.35
+ ID2= 2 (0126):	24.43	0.579	13.50	64.38
ID = 3 (0155):	48.58	0.717	13.50	70.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | NASHYD (0147) | ID= 1 DT= 5.0 min

Area (ha)= 1.49 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02

3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.154 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 45.854
TOTAL RAINFALL (mm)= 95.962
RUNOFF COEFFICIENT = 0.478

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0146) ID= 1 DT= 5.0 min | Area (ha)= 2.59 Total Imp(%)= 44.00 Dir. Conn.(%)= 44.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.14	1.45
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	30.00
Length (m)=	20.75	10.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	107.44	64.61
over (min)	5.00	5.00
Storage Coeff. (min)=	0.78 (ii)	2.24 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.30

		TOTALS
PEAK FLOW (cms)=	0.34	0.607 (iii)
TIME TO PEAK (hrs)=	12.00	12.00
RUNOFF VOLUME (mm)=	94.96	48.57	68.98
TOTAL RAINFALL (mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT =	0.99	0.51	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 (0148) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0146):	2.59	0.607	12.00	68.98
+ ID2= 2 (0147):	1.49	0.154	12.08	45.85
ID = 3 (0148):	4.07	0.744	12.00	60.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0148) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0148):	4.07	0.744	12.00	60.54
+ ID2= 2 (0155):	48.58	0.717	13.50	70.33
ID = 1 (0148):	52.65	1.255	12.00	69.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 5 **
****

READ STORM Ptotal=108.06 mm | Filename: C:\Users\DMcBrayne\AppData\Local\Temp\99de1fdc-d6ae-4e6e-b844-585c8b2021ad\0f46b514 Comments: FIFTY YR SCS STORM 12 MIN TIME STEP 24 H

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	1.10	6.20	2.20	12.20	22.04	18.20	2.20
0.40	1.10	6.40	2.20	12.40	13.78	18.40	2.20
0.60	1.10	6.60	2.20	12.60	9.92	18.60	2.20
0.80	1.10	6.80	2.20	12.80	9.37	18.80	2.20
1.00	1.10	7.00	2.20	13.00	6.61	19.00	2.20
1.20	1.10	7.20	2.20	13.20	5.51	19.20	1.65
1.40	1.10	7.40	2.20	13.40	5.51	19.40	1.65
1.60	1.10	7.60	2.20	13.60	5.51	19.60	1.65
1.80	1.10	7.80	2.20	13.80	5.51	19.80	1.65
2.00	1.10	8.00	2.20	14.00	5.51	20.00	1.65
2.20	1.10	8.20	3.31	14.20	3.31	20.20	1.65
2.40	1.10	8.40	3.31	14.40	3.31	20.40	1.65
2.60	1.10	8.60	3.31	14.60	3.31	20.60	1.65
2.80	1.10	8.80	3.31	14.80	3.31	20.80	1.65
3.00	1.10	9.00	3.31	15.00	3.31	21.00	1.65
3.20	1.10	9.20	3.31	15.20	3.31	21.20	1.10
3.40	1.10	9.40	3.31	15.40	3.31	21.40	1.10
3.60	1.10	9.60	3.31	15.60	3.31	21.60	1.10
3.80	1.10	9.80	3.31	15.80	3.31	21.80	1.10
4.00	1.10	10.00	3.31	16.00	3.31	22.00	1.10
4.20	2.20	10.20	6.05	16.20	2.20	22.20	1.10
4.40	2.20	10.40	6.05	16.40	2.20	22.40	1.10
4.60	2.20	10.60	6.05	16.60	2.20	22.60	1.10
4.80	2.20	10.80	6.05	16.80	2.20	22.80	1.10
5.00	2.20	11.00	6.05	17.00	2.20	23.00	1.10
5.20	2.20	11.20	8.26	17.20	2.20	23.20	1.10
5.40	2.20	11.40	12.12	17.40	2.20	23.40	1.10
5.60	2.20	11.60	27.55	17.60	2.20	23.60	1.10
5.80	2.20	11.80	60.61	17.80	2.20	23.80	1.10
6.00	2.20	12.00	114.06	18.00	2.20	24.00	1.10

CALIB NASHYD (0114) ID= 1 DT=12.0 min | Area (ha)= 2.11 Curve Number (CN)= 74.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.26

Unit Hyd Qpeak (cms)= 0.310

PEAK FLOW (cms)= 0.231 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 54.161
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.501

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0084) | Area (ha)= 10.64

|ID= 1 DT=12.0 min | Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	7.45	3.19	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	2.36	0.58	2.938 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	57.99	92.34
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.85

***** 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 (0085) | Area (ha)= 8.53
|ID= 1 DT=12.0 min | Total Imp(%)= 68.00 Dir. Conn.(%)= 68.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	5.80	2.73	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	1.84	0.49	2.333 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	91.36
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.85

***** 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 (0108) | Area (ha)= 1.50
|ID= 1 DT=12.0 min | Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.96	0.54	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.30	0.10	0.402 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	89.40
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.83

***** 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.

DUHYD (0089)
Inlet Cap.=0.350
#of Inlets= 1
Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.40	12.00	89.40
MAJOR SYS.(ID= 2):	0.04	0.05	12.00	89.40
MINOR SYS.(ID= 3):	1.46	0.35	12.00	89.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0113) | Area (ha)= 1.21
|ID= 1 DT=12.0 min | Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.67	0.54	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	0.21	0.10	0.310 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	57.99	84.98
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.79

***** 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 (0115) | Area (ha)= 17.98
|ID= 1 DT=12.0 min | Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	10.97	7.01	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	2.00	2.00	
Length (m)=	30.00	20.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	114.06	71.61	
over (min)	12.00	12.00	
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.12	
			TOTALS
PEAK FLOW (cms)=	3.47	1.27	4.746 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	87.93
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.81

***** 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

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      THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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ADD HYD (0112) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0113):	1.21	0.310	12.00	84.98
+ ID2= 2 (0114):	2.11	0.231	12.00	54.16
ID = 3 (0112):	3.32	0.541	12.00	65.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	3.32	0.541	12.00	65.39
+ ID2= 2 (0115):	17.98	4.746	12.00	87.93
ID = 1 (0112):	21.30	5.287	12.00	84.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	21.30	5.287	12.00	84.41
+ ID2= 2 (0084):	10.64	2.938	12.00	92.34
ID = 3 (0112):	31.94	8.225	12.00	87.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	31.94	8.225	12.00	87.06
+ ID2= 2 (0085):	8.53	2.333	12.00	91.36
ID = 1 (0112):	40.47	10.558	12.00	87.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	40.47	10.558	12.00	87.96
+ ID2= 2 (0089):	0.04	0.052	12.00	89.40
ID = 3 (0112):	40.51	10.610	12.00	87.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0137) ID= 1 DT=12.0 min | Area (ha)= 1.33 | Curve Number (CN)= 74.0 | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)= 0.187 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 44.700
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.414

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0096) ID= 1 DT=12.0 min | Area (ha)= 3.62 | Total Imp(%)= 28.00 | Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	2.61
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	114.06	71.61
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.32	0.47	0.794 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	71.73
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.66

***** 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 (0138) ID= 1 DT=12.0 min | Area (ha)= 1.45 | Total Imp(%)= 64.00 | Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.93	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	114.06	71.61
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.29	0.09	0.389 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	57.99	89.40
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.83

***** 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 (0136) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0137):	1.33	0.187	12.00	44.70
+ ID2= 2 (0138):	1.45	0.389	12.00	89.40
ID = 3 (0136):	2.78	0.575	12.00	68.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0136) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0136):	2.78	0.575	12.00	68.01
+ ID2= 2 (0096):	3.62	0.794	12.00	71.73

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          ================================================
          ID = 1 (0136):     6.40    1.369     12.00     70.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0117) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)    |    (cms)     (ha.m.)
                           0.0000     0.0000    |   0.3260      0.8017
                           0.0790     0.1850    |   0.3960      0.9004
                           0.2270     0.3947    |   0.0000      0.0000

                                 AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0136)       6.400     1.369     12.00      70.12
     OUTFLOW: ID= 1 (0117)       6.400     0.119     12.90      70.02

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.69
                    TIME SHIFT OF PEAK FLOW          (min)= 54.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  0.2418

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| ROUTE PIPE (0116)|     PIPE Number     =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 850.00
--------------------     Slope      (m/m)=  0.005
                         Manning n       =  0.013

     <----------------- TRAVEL TIME TABLE ---------------------->
       DEPTH       VOLUME     FLOW RATE     VELOCITY     TRAV.TIME
         (m)       (cu.m.)       (cms)        (m/s)         min
        0.09     .367E+02          0.0         0.80         17.68
        0.17     .102E+03          0.1         1.25         11.33
        0.26     .184E+03          0.3         1.61          8.81
        0.35     .278E+03          0.6         1.91          7.41
        0.43     .382E+03          1.0         2.18          6.51
        0.52     .492E+03          1.4         2.41          5.88
        0.61     .608E+03          1.9         2.61          5.43
        0.69     .727E+03          2.4         2.79          5.08
        0.78     .848E+03          2.9         2.95          4.81
        0.87     .970E+03          3.5         3.08          4.60
        0.96     .109E+04          4.1         3.20          4.43
        1.04     .121E+04          4.7         3.29          4.31
        1.13     .133E+04          5.2         3.36          4.22
        1.22     .144E+04          5.8         3.41          4.15
        1.30     .154E+04          6.2         3.44          4.12
        1.39     .163E+04          6.6         3.43          4.13
        1.48     .172E+04          6.9         3.40          4.17
        1.56     .178E+04          6.9         3.31          4.28
        1.65     .182E+04          6.5         3.02          4.70
                                <---- hydrograph ---->   <-pipe / channel->
                           AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)     (cms)    (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0117)    6.40     0.12   12.90  70.02      0.15      1.09
     OUTFLOW: ID= 1 (0116)    6.40     0.12   13.00  70.02      0.15      1.08


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| ADD HYD   (0111) |
|  1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
          ID1= 1 (0112):    40.51   10.610    12.00    87.96
        + ID2= 2 (0116):     6.40    0.118    13.00    70.02
          ================================================
          ID = 3 (0111):    46.91   10.653    12.00    85.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0110) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)    |    (cms)     (ha.m.)
                           0.0000     0.0000    |   1.0010      1.0368
                           0.0410     0.1625    |   1.4640      1.1396
                           0.0970     0.4197    |   1.6230      1.3517
                           0.1600     0.6939    |   2.0260      2.0441
                           0.5090     0.8867    |   2.6870      2.2310
                           0.6570     0.9362    |   6.1640      2.6224
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                                 AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0111)      46.912    10.653     12.00      85.54
     OUTFLOW: ID= 1 (0110)      46.912     1.900     12.30      85.52

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.83
                    TIME SHIFT OF PEAK FLOW          (min)= 18.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  1.8312

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| DUHYD     (0144) |
| Inlet Cap.=2.787 |
| #of Inlets=    1 |
| Total(cms)=  2.8 |          AREA     QPEAK     TPEAK    R.V.
--------------------          (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):  46.91      1.90     12.30   85.52
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):  46.91      1.90     12.30   85.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| STANDHYD  (0081) |   Area    (ha)=   1.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        1.00          0.34
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      114.06         71.61
               over (min)        12.00         12.00
     Storage Coeff.  (min)=        0.96 (ii)     6.28 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.32          0.06          0.379 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=      107.06         58.00         94.80
     TOTAL RAINFALL   (mm)=      108.06        108.06        108.06
     RUNOFF COEFFICIENT   =        0.99          0.54          0.88

***** 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.

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| CALIB            |
| STANDHYD  (0082) |   Area    (ha)=   2.51
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        1.88          0.63
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      114.06         71.61
               over (min)        12.00         12.00
     Storage Coeff.  (min)=        0.96 (ii)     6.28 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.60          0.11          0.710 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00         12.00
     RUNOFF VOLUME    (mm)=      107.06         57.99         94.80
     TOTAL RAINFALL   (mm)=      108.06        108.06        108.06
     RUNOFF COEFFICIENT   =        0.99          0.54          0.88

***** 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 (0101) | Area (ha)= 0.47
ID= 1 DT=12.0 min | Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.33	0.14
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	114.06	71.61
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.10	0.03	0.130 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	92.33
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.85

***** 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 (0088)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	0.47	0.130	12.00	92.33
+ ID2= 2 (0082):	2.51	0.710	12.00	94.80
ID = 3 (0088):	2.98	0.840	12.00	94.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0093)
Inlet Cap.=0.934
#of Inlets= 1
Total(cms)= 0.9

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.84	12.00	94.41
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.98	0.84	12.00	94.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0094) | Area (ha)= 2.25
ID= 1 DT=12.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.35	0.90
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	114.06	71.61
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.43	0.16	0.591 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	87.43
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.81

***** 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 (0100) | Area (ha)= 1.27
ID= 1 DT=12.0 min | Total Imp(%)= 68.00 Dir. Conn.(%)= 68.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.86	0.41
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	114.06	71.61
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.27	0.07	0.347 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	57.99	91.36
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.85

***** 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.

DUHYD (0092)
Inlet Cap.=0.309
#of Inlets= 1
Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.35	12.00	91.36
MAJOR SYS.(ID= 2):	0.03	0.04	12.00	91.36
MINOR SYS.(ID= 3):	1.24	0.31	12.00	91.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0102) | Area (ha)= 2.71
ID= 1 DT=12.0 min | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	114.06	71.61
over	(min)	12.00	12.00
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.12

				TOTALS
PEAK FLOW	(cms)=	0.21	0.37	0.583 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	70.26
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.65

***** 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 (0103) ID= 1 DT=12.0 min	Area (ha)= 5.86 Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	2.58
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	114.06	71.61
over (min)	12.00	12.00
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

		TOTALS
PEAK FLOW (cms)=	1.04	0.47	1.507 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	85.47
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.79

***** 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 (0104) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	2.71	0.583	12.00	70.26
+ ID2= 2 (0103):	5.86	1.507	12.00	85.47
ID = 3 (0104):	8.57	2.090	12.00	80.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0104):	8.57	2.090	12.00	80.66
+ ID2= 2 (0081):	1.34	0.379	12.00	94.80
ID = 1 (0104):	9.91	2.469	12.00	82.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0104):	9.91	2.469	12.00	82.57
+ ID2= 2 (0092):	0.03	0.038	12.00	91.36
ID = 3 (0104):	9.94	2.508	12.00	82.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0104):	9.94	2.508	12.00	82.60
+ ID2= 2 (0093):	2.98	0.840	12.00	94.41
ID = 1 (0104):	12.92	3.348	12.00	85.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0104):	12.92	3.348	12.00	85.32
+ ID2= 2 (0094):	2.25	0.591	12.00	87.43
ID = 3 (0104):	15.17	3.938	12.00	85.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0083) ID= 1 DT=12.0 min	Area (ha)= 3.28 Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.30	0.98
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	114.06	71.61
over (min)	12.00	12.00
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

		TOTALS
PEAK FLOW (cms)=	0.73	0.18	0.906 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	92.34
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.85

***** 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 (0091) ID= 1 DT=12.0 min	Area (ha)= 2.50 Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.38	1.12
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	114.06	71.61
over (min)	12.00	12.00
Storage Coeff. (min)=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

		TOTALS
PEAK FLOW (cms)=	0.44	0.20	0.640 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	58.00	84.98
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.54	0.79

***** 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.

DUHYD (0090)

Inlet Cap.=0.502					
#of Inlets= 1					
Total(cms)= 0.5		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
TOTAL HYD.(ID= 1):		2.50	0.64	12.00	84.98
MAJOR SYS.(ID= 2):		0.12	0.14	12.00	84.98
MINOR SYS.(ID= 3):		2.38	0.50	12.00	84.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0109)	Area (ha)= 10.16				
ID= 1 DT=12.0 min	Total Imp(%)= 66.00		Dir. Conn.(%)= 66.00		
		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	6.71	3.45		
Dep. Storage	(mm)=	1.00	1.50		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	30.00	20.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(mm/hr)=		114.06	71.61		
over (min)		12.00	12.00		
Storage Coeff. (min)=		0.96 (ii)	6.28 (ii)		
Unit Hyd. Tpeak (min)=		12.00	12.00		
Unit Hyd. peak (cms)=		0.14	0.12		
				TOTALS	
PEAK FLOW	(cms)=	2.12	0.63	2.751 (iii)	
TIME TO PEAK	(hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME	(mm)=	107.06	58.00	90.38	
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06	
RUNOFF COEFFICIENT	=	0.99	0.54	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.

ADD HYD (0107)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0109):		10.16	2.751	12.00	90.38
+ ID2= 2 (0083):		3.28	0.906	12.00	92.34
ID = 3 (0107):		13.44	3.657	12.00	90.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0107):		13.44	3.657	12.00	90.86
+ ID2= 2 (0089):		1.46	0.350	12.00	89.40
ID = 1 (0107):		14.90	4.007	12.00	90.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0107):		14.90	4.007	12.00	90.72
+ ID2= 2 (0090):		2.38	0.502	12.00	84.98
ID = 3 (0107):		17.28	4.509	12.00	89.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0107):		17.28	4.509	12.00	89.93
+ ID2= 2 (0092):		1.24	0.309	12.00	91.36
ID = 1 (0107):		18.52	4.818	12.00	90.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0106)				
IN= 2---> OUT= 1				
DT= 5.0 min		OUTFLOW	STORAGE	OUTFLOW STORAGE
		(cms)	(ha.m.)	(cms) (ha.m.)
		0.0000	0.0000	0.7020 0.4603
		0.0190	0.0734	1.0110 0.9685
		0.0360	0.1913	1.0260 1.0011
		0.0460	0.2976	1.1220 1.2435
		0.5590	0.4360	0.0000 0.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0107)	18.521	4.818	12.00	90.02
OUTFLOW: ID= 1 (0106)	18.521	0.922	12.30	89.97

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.14
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.8220

ROUTE PIPE (0105)			
IN= 2---> OUT= 1		PIPE Number	= 1.00
DT= 5.0 min		Diameter	(mm)=1650.00
		Length	(m)= 467.00
		Slope	(m/m)= 0.006
		Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA	<---- hydrograph ----> QPEAK	TPEAK	R.V.	<-pipe / channel-> MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0106)	18.52	0.92	12.30	89.97	0.40	2.26
OUTFLOW: ID= 1 (0105)	18.52	0.92	12.30	89.97	0.40	2.26

ADD HYD (0099)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0104):		15.17	3.938	12.00	85.64
+ ID2= 2 (0105):		18.52	0.923	12.30	89.97
ID = 3 (0099):		33.69	4.740	12.00	88.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0099)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.

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--------------------          (ha)     (cms)     (hrs)      (mm)
*** W A R N I N G :  HYDROGRAPH 0144 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0099):    33.69   4.740    12.00    88.07
        + ID2= 2 (0144):     0.00   0.000     0.00     0.00
          ================================================
          ID = 1 (0099):    33.69   4.740    12.00    88.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0098) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |        OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------          (cms)     (ha.m.)    |   (cms)     (ha.m.)
                              0.0000     0.0000    |  0.8190      1.9354
                              0.0200     0.0920    |  0.9260      2.5967
                              0.0480     0.2529    |  1.2030      3.3403
                              0.3020     0.3889    |  1.2340      3.4062
                              0.3520     0.4239    |  4.2880      3.6759
                              0.7390     1.5375    |  0.0000      0.0000

                                   AREA     QPEAK     TPEAK       R.V.
                                   (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0099)       33.692     4.740     12.00      88.07
     OUTFLOW: ID= 1 (0098)       33.692     0.652     14.60      88.03

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.75
                    TIME SHIFT OF PEAK FLOW          (min)=156.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  1.2860

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| CALIB            |
| NASHYD    (0123) |   Area     (ha)=   1.61   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.473

     PEAK FLOW       (cms)=   0.226 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  44.700
     TOTAL RAINFALL   (mm)= 108.064
     RUNOFF COEFFICIENT   =   0.414

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (0124) |   Area     (ha)=   2.59   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.323 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  53.280
     TOTAL RAINFALL   (mm)= 108.064
     RUNOFF COEFFICIENT   =   0.493

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0086) |   Area     (ha)=  10.18
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
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                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       7.63         2.55
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      2.42         0.46         2.880 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    107.06        58.00        94.80
     TOTAL RAINFALL   (mm)=    108.06       108.06       108.06
     RUNOFF COEFFICIENT   =      0.99         0.54         0.88

***** 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.

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| CALIB            |
| STANDHYD  (0087) |   Area     (ha)=   2.21
|ID= 1 DT=12.0 min |   Total Imp(%)=  85.00   Dir. Conn.(%)=  85.00
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                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.88         0.33
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.60         0.06         0.655 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    107.06        57.99        99.70
     TOTAL RAINFALL   (mm)=    108.06       108.06       108.06
     RUNOFF COEFFICIENT   =      0.99         0.54         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.

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--------------------
| CALIB            |
| STANDHYD  (0097) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.24         0.61
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     114.06        71.61
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.96 (ii)    6.28 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.08         0.11         0.186 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00        12.00
     RUNOFF VOLUME    (mm)=    107.06        57.99        71.73
     TOTAL RAINFALL   (mm)=    108.06       108.06       108.06
     RUNOFF COEFFICIENT   =      0.99         0.54         0.66

***** 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.

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| CALIB            |
| STANDHYD  (0125) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	5.37	1.34
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	114.06	71.61
over (min)		12.00	12.00
Storage Coeff. (min)	=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)	=	12.00	12.00
Unit Hyd. peak (cms)	=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	1.70	0.24	1.944 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	97.25
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	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.

ADD HYD (0122)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0123):	1.61	0.226	12.00	44.70
+ ID2= 2 (0124):	2.59	0.323	12.00	53.28
ID = 3 (0122):	4.20	0.549	12.00	49.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0122):	4.20	0.549	12.00	49.99
+ ID2= 2 (0125):	6.71	1.944	12.00	97.25
ID = 1 (0122):	10.91	2.493	12.00	79.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0122):	10.91	2.493	12.00	79.06
+ ID2= 2 (0086):	10.18	2.880	12.00	94.80
ID = 3 (0122):	21.09	5.374	12.00	86.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0122):	21.09	5.374	12.00	86.65
+ ID2= 2 (0087):	2.21	0.655	12.00	99.70
ID = 1 (0122):	23.30	6.029	12.00	87.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0122):	23.30	6.029	12.00	87.89
+ ID2= 2 (0097):	0.85	0.186	12.00	71.73
ID = 3 (0122):	24.15	6.215	12.00	87.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0120)
IN= 2---> OUT= 1
DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1220	0.9070
0.0340	0.1438	0.1360	1.1803
0.0550	0.3009	0.1530	1.5887
0.0860	0.4370	2.5850	1.7557
0.0900	0.4726	10.7310	2.0518

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0122)	24.150	6.215	12.00	87.32
OUTFLOW: ID= 1 (0120)	24.150	0.149	16.20	87.28

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.39
TIME SHIFT OF PEAK FLOW (min)=252.00
MAXIMUM STORAGE USED (ha.m.)= 1.4889

CALIB
NASHYD (0131)
ID= 1 DT=12.0 min

Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.885 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 51.995
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.481

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0128)
ID= 1 DT=12.0 min

Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	114.06	71.61
over (min)		12.00	12.00
Storage Coeff. (min)	=	0.96 (ii)	6.28 (ii)
Unit Hyd. Tpeak (min)	=	12.00	12.00
Unit Hyd. peak (cms)	=	0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	0.41	0.19	0.599 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	84.98
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.79

***** 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 (0130)
ID= 1 DT=12.0 min

Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50

Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	114.06	71.61	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.06	0.260 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	89.40
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.83

***** 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 (0129)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0128):	2.34	0.599	12.00	84.98
+ ID2= 2 (0130):	0.97	0.260	12.00	89.40
ID = 3 (0129):	3.31	0.859	12.00	86.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0129)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0129):	3.31	0.859	12.00	86.28
+ ID2= 2 (0131):	6.53	0.885	12.00	52.00
ID = 1 (0129):	9.84	1.743	12.00	63.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0134)
ID= 1 DT=12.0 min

Area (ha)= 0.91 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.128 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 50.557
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.468

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0095)
ID= 1 DT=12.0 min

Area (ha)= 2.95
Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.74	2.21	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	114.06	71.61	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.23	0.40	0.635 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	70.26
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.65

***** 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 (0133)
ID= 1 DT=12.0 min

Area (ha)= 6.86
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	114.06	71.61	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	1.33	0.48	1.811 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	87.93
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.81

***** 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 (0135)
ID= 1 DT=12.0 min

Area (ha)= 3.87
Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.36	1.51	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	114.06	71.61	
over	(min)	12.00	12.00	
Storage Coeff.	(min)=	0.96 (ii)	6.28 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	12.00	
Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.75	0.27	1.022 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	87.93
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	0.81

***** 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 (0132)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

ID1= 1 (0133):	6.86	1.811	12.00	87.93	
+ ID2= 2 (0134):	0.91	0.128	12.00	50.56	
ID = 3 (0132):	7.77	1.939	12.00	83.55	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0132):	7.77	1.939	12.00	83.55
+ ID2= 2 (0135):	3.87	1.022	12.00	87.93
ID = 1 (0132):	11.64	2.961	12.00	85.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0132):	11.64	2.961	12.00	85.00
+ ID2= 2 (0095):	2.95	0.635	12.00	70.26
ID = 3 (0132):	14.59	3.595	12.00	82.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0127)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0132)	14.590	3.595	12.00	82.02
OUTFLOW: ID= 1 (0127)	14.590	0.678	12.30	82.01

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.86
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.4939

ROUTE PIPE (0119)
IN= 2---> OUT= 1
DT= 12.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

TRAVEL TIME TABLE

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.68	12.30	82.01	0.36	1.95
OUTFLOW: ID= 1 (0119)	14.59	0.68	12.30	82.01	0.36	1.95

ADD HYD (0118)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0119):	14.59	0.679	12.30	82.01
+ ID2= 2 (0129):	9.84	1.743	12.00	63.53
ID = 3 (0118):	24.43	2.231	12.00	74.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126)
IN= 2---> OUT= 1
DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	2.231	12.00	74.62
OUTFLOW: ID= 1 (0126)	24.430	0.649	13.60	74.61

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.10
TIME SHIFT OF PEAK FLOW (min)= 96.00
MAXIMUM STORAGE USED (ha.m.)= 0.4547

ADD HYD (0155)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0120):	24.15	0.149	16.20	87.28
+ ID2= 2 (0126):	24.43	0.649	13.60	74.61
ID = 3 (0155):	48.58	0.795	13.60	80.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0147)
ID= 1 DT= 5.0 min

Area (ha)= 1.49 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.09	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65

2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.180 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 55.163
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.510

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0146)	Area (ha)= 2.59
ID= 1 DT= 5.0 min	Total Imp(%)= 44.00 Dir. Conn.(%)= 44.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.14	1.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	30.00
Length	(m)=	20.75	10.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		114.06	72.77
over (min)		5.00	5.00
Storage Coeff. (min)=		0.77 (ii)	2.19 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.34	0.31

				TOTALS
PEAK FLOW	(cms)=	0.36	0.30	0.660 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	107.06	58.00	79.59
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.54	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 (0148)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0146):	2.59	0.660	12.00	79.59
	+ ID2= 2 (0147):	1.49	0.180	12.08	55.16
	ID = 3 (0148):	4.07	0.824	12.00	70.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0148)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1	ID1= 3 (0148):	4.07	0.824	12.00	70.67
	+ ID2= 2 (0155):	48.58	0.795	13.60	80.91
	ID = 1 (0148):	52.65	1.381	12.00	80.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 6 **
****

READ STORM	Filename: C:\Users\DMcBrayne\AppData\Local\Temp\99de1fdc-d6ae-4e6e-b844-585c8b2021ad\b46f0b66
Ptotal=112.42 mm	Comments: SCS TYPE II TWENTY FOUR HOUR, HUNDRED YE

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	1.27	6.20	2.29	12.20	21.84	18.20	2.29
0.40	1.27	6.40	2.29	12.40	13.72	18.40	2.29
0.60	1.27	6.60	2.29	12.60	9.91	18.60	2.29
0.80	1.27	6.80	2.29	12.80	9.40	18.80	2.29
1.00	1.27	7.00	2.29	13.00	6.60	19.00	2.29
1.20	1.27	7.20	2.29	13.20	5.59	19.20	1.78
1.40	1.27	7.40	2.29	13.40	5.59	19.40	1.78
1.60	1.27	7.60	2.29	13.60	5.59	19.60	1.78
1.80	1.27	7.80	2.29	13.80	5.59	19.80	1.78
2.00	1.27	8.00	2.29	14.00	5.59	20.00	1.78
2.20	1.27	8.20	3.30	14.20	3.30	20.20	1.78
2.40	1.27	8.40	3.30	14.40	3.30	20.40	1.78
2.60	1.27	8.60	3.30	14.60	3.30	20.60	1.78
2.80	1.27	8.80	3.30	14.80	3.30	20.80	1.78
3.00	1.27	9.00	3.30	15.00	3.30	21.00	1.78
3.20	1.27	9.20	3.30	15.20	3.30	21.20	1.27
3.40	1.27	9.40	3.30	15.40	3.30	21.40	1.27
3.60	1.27	9.60	3.30	15.60	3.30	21.60	1.27
3.80	1.27	9.80	3.30	15.80	3.30	21.80	1.27
4.00	1.27	10.00	3.30	16.00	3.30	22.00	1.27
4.20	2.29	10.20	6.10	16.20	2.29	22.20	1.27
4.40	2.29	10.40	6.10	16.40	2.29	22.40	1.27
4.60	2.29	10.60	6.10	16.60	2.29	22.60	1.27
4.80	2.29	10.80	6.10	16.80	2.29	22.80	1.27
5.00	2.29	11.00	6.10	17.00	2.29	23.00	1.27
5.20	2.29	11.20	8.13	17.20	2.29	23.20	1.27
5.40	2.29	11.40	11.94	17.40	2.29	23.40	1.27
5.60	2.29	11.60	27.43	17.60	2.29	23.60	1.27
5.80	2.29	11.80	59.94	17.80	2.29	23.80	1.27
6.00	2.29	12.00	126.49	18.00	2.29	24.00	1.27

CALIB		
NASHYD (0114)	Area (ha)= 2.11	Curve Number (CN)= 74.0
ID= 1 DT=12.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.26	

Unit Hyd Qpeak (cms)= 0.310

```
     PEAK FLOW       (cms)=   0.252 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  57.533
     TOTAL RAINFALL   (mm)= 112.420
     RUNOFF COEFFICIENT   =   0.512

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0084)|   Area    (ha)=  10.64
|ID= 1 DT=12.0 min|   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       7.45         3.19
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=     0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      2.62         0.65      3.270 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47       96.43
     TOTAL RAINFALL   (mm)=    112.42       112.42      112.42
     RUNOFF COEFFICIENT   =      0.99         0.55        0.86

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0085)|   Area    (ha)=   8.53
|ID= 1 DT=12.0 min|   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.80         2.73
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=     0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      2.04         0.56      2.597 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47       95.43
     TOTAL RAINFALL   (mm)=    112.42       112.42      112.42
     RUNOFF COEFFICIENT   =      0.99         0.55        0.85

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0108)|   Area    (ha)=   1.50
|ID= 1 DT=12.0 min|   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.96         0.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.34         0.11      0.448 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47       93.44
     TOTAL RAINFALL   (mm)=    112.42       112.42      112.42
     RUNOFF COEFFICIENT   =      0.99         0.55        0.83

***** 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.

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-------------------
| DUHYD     (0089)|
| Inlet Cap.=0.350|
| #of Inlets=    1|
| Total(cms)=  0.3|       AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.50      0.45     12.00    93.44
     ==================================================
     MAJOR SYS.(ID= 2):   0.08      0.10     12.00    93.44
     MINOR SYS.(ID= 3):   1.42      0.35     12.00    93.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0113)|   Area    (ha)=   1.21
|ID= 1 DT=12.0 min|   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.67         0.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=     0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.23         0.11      0.345 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00       12.00
     RUNOFF VOLUME    (mm)=    111.42        61.47       88.94
     TOTAL RAINFALL   (mm)=    112.42       112.42      112.42
     RUNOFF COEFFICIENT   =      0.99         0.55        0.79

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0115)|   Area    (ha)=  17.98
|ID= 1 DT=12.0 min|   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.97         7.01
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=     0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.12
```

				TOTALS
PEAK FLOW (cms)=	3.85	1.44		5.289 (iii)
TIME TO PEAK (hrs)=	12.00	12.00		12.00
RUNOFF VOLUME (mm)=	111.42	61.47		91.94
TOTAL RAINFALL (mm)=	112.42	112.42		112.42
RUNOFF COEFFICIENT =	0.99	0.55		0.82

***** 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 (0112) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0113):	1.21	0.345	12.00	88.94
+ ID2= 2 (0114):	2.11	0.252	12.00	57.53
ID = 3 (0112):	3.32	0.598	12.00	68.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) | 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	3.32	0.598	12.00	68.98
+ ID2= 2 (0115):	17.98	5.289	12.00	91.94
ID = 1 (0112):	21.30	5.887	12.00	88.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	21.30	5.887	12.00	88.36
+ ID2= 2 (0084):	10.64	3.270	12.00	96.43
ID = 3 (0112):	31.94	9.157	12.00	91.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) | 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	31.94	9.157	12.00	91.05
+ ID2= 2 (0085):	8.53	2.597	12.00	95.43
ID = 1 (0112):	40.47	11.754	12.00	91.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	40.47	11.754	12.00	91.97
+ ID2= 2 (0089):	0.08	0.098	12.00	93.44
ID = 3 (0112):	40.55	11.852	12.00	91.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | NASHYD (0137) | ID= 1 DT=12.0 min

Area (ha)= 1.33 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13
Unit Hyd Qpeak (cms)= 0.391

PEAK FLOW (cms)=	0.209 (i)
TIME TO PEAK (hrs)=	12.000
RUNOFF VOLUME (mm)=	47.484
TOTAL RAINFALL (mm)=	112.420
RUNOFF COEFFICIENT =	0.422

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0096) | ID= 1 DT=12.0 min

Area (ha)= 3.62
Total Imp(%)= 28.00 Dir. Conn.(%)= 28.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.01	2.61
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	126.49	80.66
over (min)	12.00	12.00
Storage Coeff. (min)=	0.92 (ii)	5.99 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

			TOTALS
PEAK FLOW (cms)=	0.36	0.53	0.890 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	111.42	61.47	75.45
TOTAL RAINFALL (mm)=	112.42	112.42	112.42
RUNOFF COEFFICIENT =	0.99	0.55	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.

CALIB | STANDHYD (0138) | ID= 1 DT=12.0 min

Area (ha)= 1.45
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.93	0.52
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	20.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	126.49	80.66
over (min)	12.00	12.00
Storage Coeff. (min)=	0.92 (ii)	5.99 (ii)
Unit Hyd. Tpeak (min)=	12.00	12.00
Unit Hyd. peak (cms)=	0.14	0.12

			TOTALS
PEAK FLOW (cms)=	0.33	0.11	0.433 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	111.42	61.47	93.44
TOTAL RAINFALL (mm)=	112.42	112.42	112.42
RUNOFF COEFFICIENT =	0.99	0.55	0.83

***** 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 (0136) | 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0137):	1.33	0.209	12.00	47.48
+ ID2= 2 (0138):	1.45	0.433	12.00	93.44

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          ID = 3 (0136):     2.78   0.642    12.00    71.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0136) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0136):     2.78   0.642    12.00    71.45
        + ID2= 2 (0096):     3.62   0.890    12.00    75.45
          ================================================
          ID = 1 (0136):     6.40   1.531    12.00    73.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0117) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |  0.3260     0.8017
                          0.0790     0.1850    |  0.3960     0.9004
                          0.2270     0.3947    |  0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0136)     6.400     1.531     12.00      73.71
     OUTFLOW: ID= 1 (0117)     6.400     0.127     12.80      73.62

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.30
                TIME SHIFT OF PEAK FLOW          (min)= 48.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.2533

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| ROUTE PIPE (0116)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 850.00
-------------------      Slope      (m/m)=  0.005
                         Manning n         =  0.013

     <----------------- TRAVEL TIME TABLE -------------------->
       DEPTH      VOLUME     FLOW RATE    VELOCITY    TRAV.TIME
        (m)      (cu.m.)       (cms)        (m/s)        min
       0.09     .367E+02        0.0         0.80        17.68
       0.17     .102E+03        0.1         1.25        11.33
       0.26     .184E+03        0.3         1.61         8.81
       0.35     .278E+03        0.6         1.91         7.41
       0.43     .382E+03        1.0         2.18         6.51
       0.52     .492E+03        1.4         2.41         5.88
       0.61     .608E+03        1.9         2.61         5.43
       0.69     .727E+03        2.4         2.79         5.08
       0.78     .848E+03        2.9         2.95         4.81
       0.87     .970E+03        3.5         3.08         4.60
       0.96     .109E+04        4.1         3.20         4.43
       1.04     .121E+04        4.7         3.29         4.31
       1.13     .133E+04        5.2         3.36         4.22
       1.22     .144E+04        5.8         3.41         4.15
       1.30     .154E+04        6.2         3.44         4.12
       1.39     .163E+04        6.6         3.43         4.13
       1.48     .172E+04        6.9         3.40         4.17
       1.56     .178E+04        6.9         3.31         4.28
       1.65     .182E+04        6.5         3.02         4.70
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)       (m)       (m/s)
     INFLOW : ID= 2 (0117)     6.40     0.13   12.80  73.62       0.16       1.13
     OUTFLOW: ID= 1 (0116)     6.40     0.13   12.90  73.62       0.16       1.12

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| ADD HYD   (0111) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0112):    40.55  11.852    12.00    91.98
        + ID2= 2 (0116):     6.40   0.127    12.90    73.62
          ================================================
          ID = 3 (0111):    46.95  11.896    12.00    89.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0110) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |  1.0010     1.0368
                          0.0410     0.1625    |  1.4640     1.1396
                          0.0970     0.4197    |  1.6230     1.3517
                          0.1600     0.6939    |  2.0260     2.0441
                          0.5090     0.8867    |  2.6870     2.2310
                          0.6570     0.9362    |  6.1640     2.6224

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0111)    46.945    11.896     12.00      89.50
     OUTFLOW: ID= 1 (0110)    46.945     1.957     12.30      89.48

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.45
                TIME SHIFT OF PEAK FLOW          (min)= 18.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  1.9284

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| DUHYD     (0144) |
| Inlet Cap.=2.787 |
| #of Inlets=    1 |
| Total(cms)=  2.8 |          AREA     QPEAK     TPEAK    R.V.
-------------------           (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):    46.95      1.96     12.30    89.48
     ================================================================
     MAJOR SYS.(ID= 2):     0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):    46.95      1.96     12.30    89.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| STANDHYD  (0081) |   Area     (ha)=   1.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        1.00          0.34
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      126.49         80.66
               over (min)        12.00         12.00
     Storage Coeff.  (min)=        0.92 (ii)     5.99 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
     Unit Hyd. peak  (cms)=        0.14          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.35          0.07       0.422 (iii)
     TIME TO PEAK    (hrs)=       12.00         12.00      12.00
     RUNOFF VOLUME    (mm)=      111.42         61.47      98.93
     TOTAL RAINFALL   (mm)=      112.42        112.42     112.42
     RUNOFF COEFFICIENT   =        0.99          0.55       0.88

***** 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.

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| CALIB            |
| STANDHYD  (0082) |   Area     (ha)=   2.51
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        1.88          0.63
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        2.00          2.00
     Length            (m)=       30.00         20.00
     Mannings n           =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      126.49         80.66
               over (min)        12.00         12.00
     Storage Coeff.  (min)=        0.92 (ii)     5.99 (ii)
     Unit Hyd. Tpeak (min)=       12.00         12.00
```

Unit Hyd. peak	(cms)=	0.14	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.66	0.13	0.790 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	111.42	61.47	98.93
TOTAL RAINFALL	(mm)=	112.42	112.42	112.42
RUNOFF COEFFICIENT	=	0.99	0.55	0.88

***** 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 (0101) | Area (ha)= 0.47
ID= 1 DT=12.0 min | Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.33	0.14
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		126.49	80.66
over (min)		12.00	12.00
Storage Coeff. (min)=		0.92 (ii)	5.99 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12
			TOTALS
PEAK FLOW	(cms)=	0.12	0.03 0.144 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00 12.00
RUNOFF VOLUME	(mm)=	111.42	61.47 96.42
TOTAL RAINFALL	(mm)=	112.42	112.42 112.42
RUNOFF COEFFICIENT	=	0.99	0.55 0.86

***** 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 (0088)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	0.47	0.144	12.00	96.42
+ ID2= 2 (0082):	2.51	0.790	12.00	98.93
ID = 3 (0088):	2.98	0.934	12.00	98.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0093)
Inlet Cap.=0.934
#of Inlets= 1
Total(cms)= 0.9

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.98	0.93	12.00	98.54
MAJOR SYS.(ID= 2):	0.00	0.00	12.00	98.54
MINOR SYS.(ID= 3):	2.98	0.93	12.00	98.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0094) | Area (ha)= 2.25
ID= 1 DT=12.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.35	0.90
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		126.49	80.66
over (min)		12.00	12.00
Storage Coeff. (min)=		0.92 (ii)	5.99 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12
			TOTALS
PEAK FLOW	(cms)=	0.47	0.18 0.659 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00 12.00
RUNOFF VOLUME	(mm)=	111.42	61.47 91.44
TOTAL RAINFALL	(mm)=	112.42	112.42 112.42
RUNOFF COEFFICIENT	=	0.99	0.55 0.81

***** 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 (0100) | Area (ha)= 1.27
ID= 1 DT=12.0 min | Total Imp(%)= 68.00 Dir. Conn.(%)= 68.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.86	0.41
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		126.49	80.66
over (min)		12.00	12.00
Storage Coeff. (min)=		0.92 (ii)	5.99 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12
			TOTALS
PEAK FLOW	(cms)=	0.30	0.08 0.387 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00 12.00
RUNOFF VOLUME	(mm)=	111.42	61.47 95.43
TOTAL RAINFALL	(mm)=	112.42	112.42 112.42
RUNOFF COEFFICIENT	=	0.99	0.55 0.85

***** 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.

DUHYD (0092)
Inlet Cap.=0.309
#of Inlets= 1
Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.39	12.00	95.43
MAJOR SYS.(ID= 2):	0.06	0.08	12.00	95.43
MINOR SYS.(ID= 3):	1.21	0.31	12.00	95.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0102) | Area (ha)= 2.71
ID= 1 DT=12.0 min | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		126.49	80.66
over (min)		12.00	12.00
Storage Coeff. (min)=		0.92 (ii)	5.99 (ii)

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     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.42          0.654 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     111.42        61.47          73.95
     TOTAL RAINFALL   (mm)=     112.42       112.42         112.42
     RUNOFF COEFFICIENT   =       0.99         0.55           0.66

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0103) |   Area    (ha)=   5.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.28         2.58
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.15         0.53          1.681 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     111.42        61.47          89.44
     TOTAL RAINFALL   (mm)=     112.42       112.42         112.42
     RUNOFF COEFFICIENT   =       0.99         0.55           0.80

***** 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.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0102):      2.71    0.654    12.00    73.95
       + ID2= 2 (0103):      5.86    1.681    12.00    89.44
         ==========================================================
         ID = 3 (0104):      8.57    2.335    12.00    84.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   3 +  2 =   1   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0104):      8.57    2.335    12.00    84.54
       + ID2= 2 (0081):      1.34    0.422    12.00    98.93
         ==========================================================
         ID = 1 (0104):      9.91    2.757    12.00    86.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0104):      9.91    2.757    12.00    86.49
       + ID2= 2 (0092):      0.06    0.078    12.00    95.43
         ==========================================================
         ID = 3 (0104):      9.97    2.834    12.00    86.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   3 +  2 =   1   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0104):      9.97    2.834    12.00    86.54
       + ID2= 2 (0093):      2.98    0.934    12.00    98.54
         ==========================================================
         ID = 1 (0104):     12.95    3.768    12.00    89.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =   3   |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0104):     12.95    3.768    12.00    89.30
       + ID2= 2 (0094):      2.25    0.659    12.00    91.44
         ==========================================================
         ID = 3 (0104):     15.20    4.427    12.00    89.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0083) |   Area    (ha)=   3.28
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.30         0.98
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.81         0.20          1.008 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     111.42        61.47          96.43
     TOTAL RAINFALL   (mm)=     112.42       112.42         112.42
     RUNOFF COEFFICIENT   =       0.99         0.55           0.86

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0091) |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.38         1.12
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    126.49        80.66
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      0.92 (ii)    5.99 (ii)
     Unit Hyd. Tpeak (min)=      12.00        12.00
     Unit Hyd. peak  (cms)=       0.14         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.48         0.23          0.713 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     111.42        61.47          88.94
     TOTAL RAINFALL   (mm)=     112.42       112.42         112.42
     RUNOFF COEFFICIENT   =       0.99         0.55           0.79
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***** 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.

DUHYD (0090)
Inlet Cap.=0.502
#of Inlets= 1
Total(cms)= 0.5

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.50	0.71	12.00	88.94
MAJOR SYS.(ID= 2):	0.17	0.21	12.00	88.94
MINOR SYS.(ID= 3):	2.33	0.50	12.00	88.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0109)
ID= 1 DT=12.0 min

Area (ha)= 10.16
Total Imp(%)= 66.00 Dir. Conn.(%)= 66.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	6.71	3.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		126.49	80.66
over (min)		12.00	12.00
Storage Coeff. (min)=		0.92 (ii)	5.99 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.12

		TOTALS
PEAK FLOW	(cms)=	3.063 (iii)
TIME TO PEAK	(hrs)=	12.00
RUNOFF VOLUME	(mm)=	94.44
TOTAL RAINFALL	(mm)=	112.42
RUNOFF COEFFICIENT	=	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.

ADD HYD (0107)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0109):	10.16	3.063	12.00	94.44
+ ID2= 2 (0083):	3.28	1.008	12.00	96.43
ID = 3 (0107):	13.44	4.071	12.00	94.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0107):	13.44	4.071	12.00	94.92
+ ID2= 2 (0089):	1.42	0.350	12.00	93.44
ID = 1 (0107):	14.86	4.421	12.00	94.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0107):	14.86	4.421	12.00	94.78
+ ID2= 2 (0090):	2.33	0.502	12.00	88.94
ID = 3 (0107):	17.19	4.923	12.00	93.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0107):	17.19	4.923	12.00	93.99
+ ID2= 2 (0092):	1.21	0.309	12.00	95.43
ID = 1 (0107):	18.40	5.232	12.00	94.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0106)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.7020	0.4603
0.0190	0.0734	1.0110	0.9685
0.0360	0.1913	1.0260	1.0011
0.0460	0.2976	1.1220	1.2435
0.5590	0.4360	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0107)	18.405	5.232	12.00	94.08
OUTFLOW: ID= 1 (0106)	18.405	0.941	12.30	94.03

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.98
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.8538

ROUTE PIPE (0105)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 467.00
Slope (m/m)= 0.006
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0106)	18.40	0.94	12.30	94.03	0.40	2.28
OUTFLOW: ID= 1 (0105)	18.40	0.94	12.30	94.03	0.41	2.28

ADD HYD (0099)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				

```
          ID1= 1 (0104):    15.20   4.427    12.00    89.62
        + ID2= 2 (0105):    18.40   0.943    12.30    94.03
          ================================================
          ID = 3 (0099):    33.60   5.234    12.00    92.09

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0099) |
|   3 +  2 =   1   |          AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0144 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
*** W A R N I N G :  HYDROGRAPH 0001 = HYDROGRAPH 0003
          ID1= 3 (0099):    33.60   5.234    12.00    92.09
        + ID2= 2 (0144):     0.00   0.000     0.00     0.00
          ================================================
          ID = 1 (0099):    33.60   5.234    12.00    92.09

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0098) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |    (cms)     (ha.m.)
                          0.0000     0.0000    |   0.8190     1.9354
                          0.0200     0.0920    |   0.9260     2.5967
                          0.0480     0.2529    |   1.2030     3.3403
                          0.3020     0.3889    |   1.2340     3.4062
                          0.3520     0.4239    |   4.2880     3.6759
                          0.7390     1.5375    |   0.0000     0.0000

                               AREA     QPEAK     TPEAK      R.V.
                               (ha)     (cms)     (hrs)      (mm)
    INFLOW : ID= 2 (0099)     33.603     5.234     12.00     92.09
    OUTFLOW: ID= 1 (0098)     33.603     0.670     14.70     92.05

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.80
                  TIME SHIFT OF PEAK FLOW         (min)=162.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  1.3387

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--------------------
| CALIB            |
| NASHYD    (0123) |   Area     (ha)=   1.61   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

    Unit Hyd Qpeak  (cms)=   0.473

    PEAK FLOW       (cms)=   0.253 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  47.484
    TOTAL RAINFALL   (mm)= 112.420
    RUNOFF COEFFICIENT   =   0.422

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0124) |   Area     (ha)=   2.59   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

    Unit Hyd Qpeak  (cms)=   0.450

    PEAK FLOW       (cms)=   0.355 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  56.597
    TOTAL RAINFALL   (mm)= 112.420
    RUNOFF COEFFICIENT   =   0.503

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0086) |   Area     (ha)=  10.18
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       7.63         2.55
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     126.49        80.66
                  over (min)       12.00        12.00
    Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=       12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                          *TOTALS*
    PEAK FLOW       (cms)=       2.68         0.52         3.204 (iii)
    TIME TO PEAK    (hrs)=      12.00        12.00         12.00
    RUNOFF VOLUME    (mm)=     111.42        61.47         98.93
    TOTAL RAINFALL   (mm)=     112.42       112.42        112.42
    RUNOFF COEFFICIENT   =       0.99         0.55          0.88

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0087) |   Area     (ha)=   2.21
|ID= 1 DT=12.0 min |   Total Imp(%)=  85.00   Dir. Conn.(%)=  85.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       1.88         0.33
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     126.49        80.66
                  over (min)       12.00        12.00
    Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=       12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                          *TOTALS*
    PEAK FLOW       (cms)=       0.66         0.07         0.728 (iii)
    TIME TO PEAK    (hrs)=      12.00        12.00         12.00
    RUNOFF VOLUME    (mm)=     111.42        61.47        103.93
    TOTAL RAINFALL   (mm)=     112.42       112.42        112.42
    RUNOFF COEFFICIENT   =       0.99         0.55          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.

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--------------------
| CALIB            |
| STANDHYD  (0097) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       0.24         0.61
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       2.00         2.00
    Length            (m)=      30.00        20.00
    Mannings n           =      0.013        0.250

    Max.Eff.Inten.(mm/hr)=     126.49        80.66
                  over (min)       12.00        12.00
    Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=       12.00        12.00
    Unit Hyd. peak  (cms)=       0.14         0.12
                                                          *TOTALS*
    PEAK FLOW       (cms)=       0.08         0.13         0.209 (iii)
    TIME TO PEAK    (hrs)=      12.00        12.00         12.00
    RUNOFF VOLUME    (mm)=     111.42        61.47         75.45
    TOTAL RAINFALL   (mm)=     112.42       112.42        112.42
    RUNOFF COEFFICIENT   =       0.99         0.55          0.67

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
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      (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.

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-------------------
| CALIB           |
| STANDHYD  (0125)|   Area    (ha)=   6.71
|ID= 1 DT=12.0 min|   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      5.37         1.34
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=    126.49        80.66
              over (min)       12.00        12.00
    Storage Coeff.  (min)=     0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=      1.89         0.27      2.161 (iii)
    TIME TO PEAK    (hrs)=     12.00        12.00       12.00
    RUNOFF VOLUME    (mm)=    111.42        61.47      101.43
    TOTAL RAINFALL   (mm)=    112.42       112.42      112.42
    RUNOFF COEFFICIENT   =      0.99         0.55        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.

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-------------------
| ADD HYD   (0122)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0123):     1.61   0.253    12.00    47.48
       + ID2= 2 (0124):     2.59   0.355    12.00    56.60
         ================================================
         ID = 3 (0122):     4.20   0.608    12.00    53.10

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0122):     4.20   0.608    12.00    53.10
       + ID2= 2 (0125):     6.71   2.161    12.00   101.43
         ================================================
         ID = 1 (0122):    10.91   2.769    12.00    82.83

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| ADD HYD   (0122)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0122):    10.91   2.769    12.00    82.83
       + ID2= 2 (0086):    10.18   3.204    12.00    98.93
         ================================================
         ID = 3 (0122):    21.09   5.972    12.00    90.60

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0122):    21.09   5.972    12.00    90.60
       + ID2= 2 (0087):     2.21   0.728    12.00   103.93
         ================================================
         ID = 1 (0122):    23.30   6.700    12.00    91.86

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0122):    23.30   6.700    12.00    91.86
       + ID2= 2 (0097):     0.85   0.209    12.00    75.45
         ================================================
         ID = 3 (0122):    24.15   6.909    12.00    91.29

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR (0120)|
| IN= 2---> OUT= 1|
| DT= 12.0 min    |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                        0.0000     0.0000    |  0.1220      0.9070
                        0.0340     0.1438    |  0.1360      1.1803
                        0.0550     0.3009    |  0.1530      1.5887
                        0.0860     0.4370    |  2.5850      1.7557
                        0.0900     0.4726    | 10.7310      2.0518

                                  AREA     QPEAK     TPEAK      R.V.
                                   (ha)     (cms)     (hrs)      (mm)
    INFLOW : ID= 2 (0122)      24.150     6.909     12.00      91.29
    OUTFLOW: ID= 1 (0120)      24.150     0.151     16.20      91.24

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.19
                  TIME SHIFT OF PEAK FLOW         (min)=252.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  1.5500

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-------------------
| CALIB           |
| NASHYD    (0131)|   Area    (ha)=   6.53   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min|   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

    Unit Hyd Qpeak  (cms)=   1.313

    PEAK FLOW       (cms)=   0.977 (i)
    TIME TO PEAK    (hrs)=  12.000
    RUNOFF VOLUME    (mm)=  55.233
    TOTAL RAINFALL   (mm)= 112.420
    RUNOFF COEFFICIENT   =   0.491

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0128)|   Area    (ha)=   2.34
|ID= 1 DT=12.0 min|   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      1.29         1.05
    Dep. Storage     (mm)=      1.00         1.50
    Average Slope     (%)=      2.00         2.00
    Length            (m)=     30.00        20.00
    Mannings n           =     0.013        0.250

    Max.Eff.Inten.(mm/hr)=    126.49        80.66
              over (min)       12.00        12.00
    Storage Coeff.  (min)=     0.92 (ii)    5.99 (ii)
    Unit Hyd. Tpeak (min)=     12.00        12.00
    Unit Hyd. peak  (cms)=      0.14         0.12
                                                    *TOTALS*
    PEAK FLOW       (cms)=      0.45         0.22      0.668 (iii)
    TIME TO PEAK    (hrs)=     12.00        12.00       12.00
    RUNOFF VOLUME    (mm)=    111.42        61.47       88.94
    TOTAL RAINFALL   (mm)=    112.42       112.42      112.42
    RUNOFF COEFFICIENT   =      0.99         0.55        0.79

***** 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
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      THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB                |
| STANDHYD  (0130)     |   Area    (ha)=   0.97
|ID= 1 DT=12.0 min     |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
  Surface Area     (ha)=       0.62         0.35
  Dep. Storage     (mm)=       1.00         1.50
  Average Slope     (%)=       2.00         2.00
  Length            (m)=      30.00        20.00
  Mannings n           =      0.013        0.250

  Max.Eff.Inten.(mm/hr)=     126.49        80.66
            over (min)       12.00        12.00
  Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
  Unit Hyd. Tpeak (min)=      12.00        12.00
  Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
  PEAK FLOW       (cms)=       0.22         0.07       0.290 (iii)
  TIME TO PEAK    (hrs)=      12.00        12.00        12.00
  RUNOFF VOLUME    (mm)=     111.42        61.47        93.44
  TOTAL RAINFALL   (mm)=     112.42       112.42       112.42
  RUNOFF COEFFICIENT   =       0.99         0.55         0.83

***** 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.

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--------------------
| ADD HYD   (0129)   |
|   1 +  2 =  3      |          AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (0128):     2.34   0.668    12.00    88.94
      + ID2= 2 (0130):     0.97   0.290    12.00    93.44
        ================================================
        ID = 3 (0129):     3.31   0.957    12.00    90.26

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0129)   |
|   3 +  2 =  1      |          AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (0129):     3.31   0.957    12.00    90.26
      + ID2= 2 (0131):     6.53   0.977    12.00    55.23
        ================================================
        ID = 1 (0129):     9.84   1.935    12.00    67.01

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB                |
| NASHYD    (0134)     |   Area    (ha)=   0.91   Curve Number   (CN)= 74.0
|ID= 1 DT=12.0 min     |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------     U.H. Tp(hrs)=   0.17

  Unit Hyd Qpeak  (cms)=   0.204

  PEAK FLOW       (cms)=   0.142 (i)
  TIME TO PEAK    (hrs)=  12.000
  RUNOFF VOLUME    (mm)=  53.705
  TOTAL RAINFALL   (mm)= 112.420
  RUNOFF COEFFICIENT   =   0.478

  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB                |
| STANDHYD  (0095)     |   Area    (ha)=   2.95
|ID= 1 DT=12.0 min     |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
  Surface Area     (ha)=       0.74         2.21
  Dep. Storage     (mm)=       1.00         1.50
  Average Slope     (%)=       2.00         2.00
  Length            (m)=      30.00        20.00
  Mannings n           =      0.013        0.250

  Max.Eff.Inten.(mm/hr)=     126.49        80.66
            over (min)       12.00        12.00
  Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
  Unit Hyd. Tpeak (min)=      12.00        12.00
  Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
  PEAK FLOW       (cms)=       0.26         0.45       0.712 (iii)
  TIME TO PEAK    (hrs)=      12.00        12.00        12.00
  RUNOFF VOLUME    (mm)=     111.42        61.47        73.95
  TOTAL RAINFALL   (mm)=     112.42       112.42       112.42
  RUNOFF COEFFICIENT   =       0.99         0.55         0.66

***** 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.

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--------------------
| CALIB                |
| STANDHYD  (0133)     |   Area    (ha)=   6.86
|ID= 1 DT=12.0 min     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
  Surface Area     (ha)=       4.18         2.68
  Dep. Storage     (mm)=       1.00         1.50
  Average Slope     (%)=       2.00         2.00
  Length            (m)=      30.00        20.00
  Mannings n           =      0.013        0.250

  Max.Eff.Inten.(mm/hr)=     126.49        80.66
            over (min)       12.00        12.00
  Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
  Unit Hyd. Tpeak (min)=      12.00        12.00
  Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
  PEAK FLOW       (cms)=       1.47         0.55       2.018 (iii)
  TIME TO PEAK    (hrs)=      12.00        12.00        12.00
  RUNOFF VOLUME    (mm)=     111.42        61.47        91.94
  TOTAL RAINFALL   (mm)=     112.42       112.42       112.42
  RUNOFF COEFFICIENT   =       0.99         0.55         0.82

***** 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.

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--------------------
| CALIB                |
| STANDHYD  (0135)     |   Area    (ha)=   3.87
|ID= 1 DT=12.0 min     |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
  Surface Area     (ha)=       2.36         1.51
  Dep. Storage     (mm)=       1.00         1.50
  Average Slope     (%)=       2.00         2.00
  Length            (m)=      30.00        20.00
  Mannings n           =      0.013        0.250

  Max.Eff.Inten.(mm/hr)=     126.49        80.66
            over (min)       12.00        12.00
  Storage Coeff.  (min)=       0.92 (ii)    5.99 (ii)
  Unit Hyd. Tpeak (min)=      12.00        12.00
  Unit Hyd. peak  (cms)=       0.14         0.12
                                                    *TOTALS*
  PEAK FLOW       (cms)=       0.83         0.31       1.138 (iii)
  TIME TO PEAK    (hrs)=      12.00        12.00        12.00
  RUNOFF VOLUME    (mm)=     111.42        61.47        91.94
  TOTAL RAINFALL   (mm)=     112.42       112.42       112.42
  RUNOFF COEFFICIENT   =       0.99         0.55         0.82

***** 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 (0132) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0133):	6.86	2.018	12.00	91.94
+ ID2= 2 (0134):	0.91	0.142	12.00	53.70
ID = 3 (0132):	7.77	2.160	12.00	87.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0132):	7.77	2.160	12.00	87.46
+ ID2= 2 (0135):	3.87	1.138	12.00	91.94
ID = 1 (0132):	11.64	3.299	12.00	88.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0132):	11.64	3.299	12.00	88.95
+ ID2= 2 (0095):	2.95	0.712	12.00	73.95
ID = 3 (0132):	14.59	4.011	12.00	85.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0127)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4563
0.1220	0.1110	0.8770	0.7650
0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0132)	14.590	4.011	12.00	85.92
OUTFLOW: ID= 1 (0127)	14.590	0.699	12.30	85.90

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.43
TIME SHIFT OF PEAK FLOW (min)= 18.00
MAXIMUM STORAGE USED (ha.m.)= 0.5224

ROUTE PIPE (0119)
IN= 2---> OUT= 1
DT= 12.0 min

Pipe Number = 1.00
Diameter (mm)=1650.00
Length (m)= 500.00
Slope (m/m)= 0.005
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.70	12.30	85.90	0.37	1.96
OUTFLOW: ID= 1 (0119)	14.59	0.70	12.30	85.90	0.37	1.96

ADD HYD (0118) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0119):	14.59	0.699	12.30	85.90
+ ID2= 2 (0129):	9.84	1.935	12.00	67.01
ID = 3 (0118):	24.43	2.434	12.00	78.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126)
IN= 2---> OUT= 1
DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	2.434	12.00	78.35
OUTFLOW: ID= 1 (0126)	24.430	0.666	13.60	78.35

PEAK FLOW REDUCTION [Qout/Qin](%)= 27.36
TIME SHIFT OF PEAK FLOW (min)= 96.00
MAXIMUM STORAGE USED (ha.m.)= 0.4785

ADD HYD (0155) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0120):	24.15	0.151	16.20	91.24
+ ID2= 2 (0126):	24.43	0.666	13.60	78.35
ID = 3 (0155):	48.58	0.815	13.70	84.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0147)
ID= 1 DT= 5.0 min

Area (ha)= 1.49 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78

1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.198 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 58.597
TOTAL RAINFALL (mm)= 112.421
RUNOFF COEFFICIENT = 0.521

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0146) ID= 1 DT= 5.0 min | Area (ha)= 2.59 Total Imp(%)= 44.00 Dir. Conn.(%)= 44.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.14	1.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	30.00
Length	(m)=	20.75	10.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		126.49	82.04
over (min)		5.00	5.00
Storage Coeff. (min)=		0.74 (ii)	2.10 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.34	0.31

		TOTALS
PEAK FLOW	(cms)=	0.739 (iii)
TIME TO PEAK	(hrs)=	12.00
RUNOFF VOLUME	(mm)=	83.45
TOTAL RAINFALL	(mm)=	112.42
RUNOFF COEFFICIENT	=	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 (0148) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0146):	2.59	0.739	12.00	83.45
+ ID2= 2 (0147):	1.49	0.198	12.08	58.60
ID = 3 (0148):	4.07	0.916	12.00	74.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

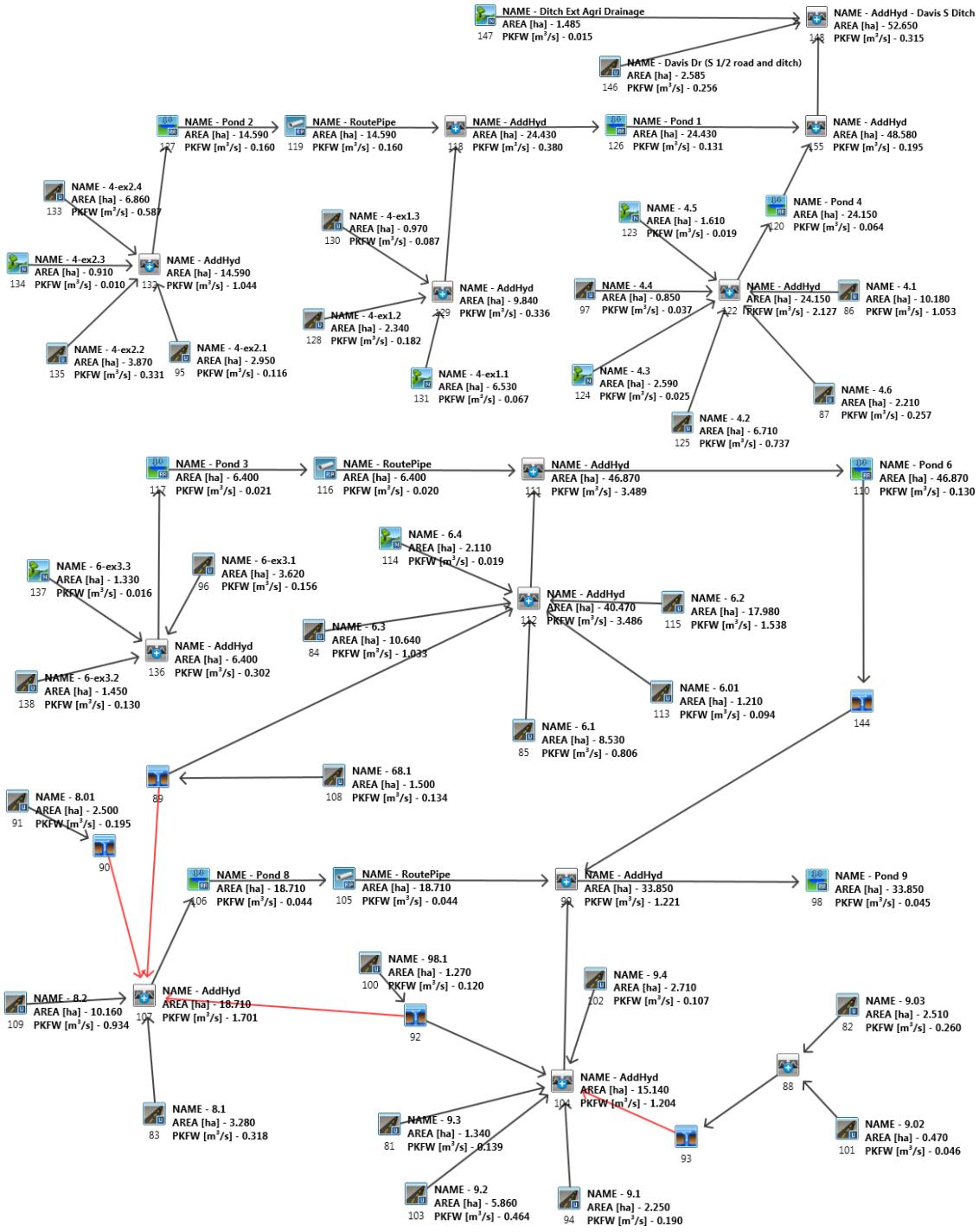
ADD HYD (0148) 3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0148):	4.07	0.916	12.00	74.38
+ ID2= 2 (0155):	48.58	0.815	13.70	84.76
ID = 1 (0148):	52.65	1.484	12.00	83.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

L09-301
Glenway golf course development, Newmarket, ON
25 mm 4 Hour Chicago Storm Post-Development Model Schematic
November 2013

VO2 Model Schematic



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================================================================================================
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       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O    Company
        OOO     T      T    H   H    Y    M   M   OOO                Serial

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                    *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual Otthymo 3.0\VO2\voin.dat
  Output  filename: C:\Users\DMcBrayne\AppData\Local\Temp\383c09af-1c67-4e68-8040-
cd4bb2cb04c0\Scenario.out
  Summary filename: C:\Users\DMcBrayne\AppData\Local\Temp\383c09af-1c67-4e68-8040-
cd4bb2cb04c0\Scenario.sum


DATE: 11/20/2013                          TIME: 07:23:38

USER:


COMMENTS: _____________________________________________________


-------------------------------------------------------------------------------------------------
-----
  ****************************
  ** SIMULATION NUMBER:   7 **
  ****************************

--------------------
| CHICAGO STORM    |     IDF curve parameters: A=1770.000
| Ptotal= 78.03 mm |                           B=   4.000
--------------------                           C=   0.820
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    = 10.00 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
      0.17    4.34  |  1.17   38.21  | '  2.17   10.60  |  3.17    5.19
      0.33    5.00  |  1.33  203.31  | '  2.33    8.96  |  3.33    4.81
      0.50    5.92  |  1.50   50.96  | '  2.50    7.78  |  3.50    4.48
      0.67    7.33  |  1.67   25.51  | '  2.67    6.90  |  3.67    4.20
      0.83    9.77  |  1.83   17.18  | '  2.83    6.21  |  3.83    3.96
      1.00   15.10  |  2.00   13.06  | '  3.00    5.65  |  4.00    3.74


-------------------------------------------------------------------------------
--------------------
| MODIFY STORM     |     MODIFYING PARAMETERS
| CASE= 1          |     Multiplication Factor=  0.32
--------------------     Time shift  (min)     =  0.00

      TIME    RAIN  |  TIME    RAIN  | '  TIME    RAIN  |  TIME    RAIN
       hrs   mm/hr  |   hrs   mm/hr  | '   hrs   mm/hr  |   hrs   mm/hr
     0.167    1.39  | 1.167   12.23  | ' 2.167    3.39  |  3.17    1.66
     0.333    1.60  | 1.333   65.06  | ' 2.333    2.87  |  3.33    1.54
     0.500    1.89  | 1.500   16.31  | ' 2.500    2.49  |  3.50    1.44
     0.667    2.35  | 1.667    8.16  | ' 2.667    2.21  |  3.67    1.35
     0.833    3.12  | 1.833    5.50  | ' 2.833    1.99  |  3.83    1.27
     1.000    4.83  | 2.000    4.18  | ' 3.000    1.81  |  4.00    1.20


-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0114) |     Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |     Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------     U.H. Tp(hrs)=   0.26

                         NOTE:  RAINFALL WAS TRANSFORMED TO  12.0 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
     0.200    1.42  | 1.200   21.03  | ' 2.200    3.30  |  3.20    1.64
     0.400    1.70  | 1.400   48.81  | ' 2.400    2.74  |  3.40    1.50
     0.600    2.12  | 1.600   12.24  | ' 2.600    2.35  |  3.60    1.39
     0.800    2.87  | 1.800    6.39  | ' 2.800    2.06  |  3.80    1.29
     1.000    4.55  | 2.000    4.40  | ' 3.000    1.84  |  4.00    1.21

     Unit Hyd Qpeak  (cms)=   0.310

     PEAK FLOW       (cms)=   0.019 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=   3.580
     TOTAL RAINFALL   (mm)=  24.969
     RUNOFF COEFFICIENT   =   0.143

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0084) |     Area     (ha)=  10.64
|ID= 1 DT=12.0 min |     Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       7.45          3.19
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      48.81          6.41
               over (min)        12.00         24.00
     Storage Coeff.  (min)=       1.34 (ii)    15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00         24.00
     Unit Hyd. peak  (cms)=       0.14          0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.01          0.04        1.033 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.60        1.40
     RUNOFF VOLUME    (mm)=      23.97          4.89       18.24
     TOTAL RAINFALL   (mm)=      24.97         24.97       24.97
     RUNOFF COEFFICIENT   =       0.96          0.20        0.73

***** 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  (0085) |     Area     (ha)=   8.53
|ID= 1 DT=12.0 min |     Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       5.80          2.73
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      48.81          6.41
               over (min)        12.00         24.00
     Storage Coeff.  (min)=       1.34 (ii)    15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00         24.00
     Unit Hyd. peak  (cms)=       0.14          0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.79          0.04        0.806 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.60        1.40
     RUNOFF VOLUME    (mm)=      23.97          4.89       17.86
     TOTAL RAINFALL   (mm)=      24.97         24.97       24.97
     RUNOFF COEFFICIENT   =       0.96          0.20        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.
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(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0108)	Area (ha)= 1.50				
ID= 1 DT=12.0 min	Total Imp(%)= 64.00	Dir. Conn.(%)= 64.00			

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.96	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	48.81	6.41	
over	(min)	12.00	24.00	
Storage Coeff.	(min)=	1.34 (ii)	15.32 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	24.00	
Unit Hyd. peak	(cms)=	0.14	0.06	
				TOTALS
PEAK FLOW	(cms)=	0.13	0.01	0.134 (iii)
TIME TO PEAK	(hrs)=	1.40	1.60	1.40
RUNOFF VOLUME	(mm)=	23.97	4.89	17.09
TOTAL RAINFALL	(mm)=	24.97	24.97	24.97
RUNOFF COEFFICIENT	=	0.96	0.20	0.68

***** 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.

DUHYD (0089)					
Inlet Cap.=0.350					
#of Inlets= 1					
Total(cms)= 0.3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
TOTAL HYD.(ID= 1):		1.50	0.13	1.40	17.09
MAJOR SYS.(ID= 2):		0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):		1.50	0.13	1.40	17.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0113)	Area (ha)= 1.21				
ID= 1 DT=12.0 min	Total Imp(%)= 55.00	Dir. Conn.(%)= 55.00			

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.54	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	48.81	6.41	
over	(min)	12.00	24.00	
Storage Coeff.	(min)=	1.34 (ii)	15.32 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	24.00	
Unit Hyd. peak	(cms)=	0.14	0.06	
				TOTALS
PEAK FLOW	(cms)=	0.09	0.01	0.094 (iii)
TIME TO PEAK	(hrs)=	1.40	1.60	1.40
RUNOFF VOLUME	(mm)=	23.97	4.89	15.38
TOTAL RAINFALL	(mm)=	24.97	24.97	24.97
RUNOFF COEFFICIENT	=	0.96	0.20	0.62

***** 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 (0115)	Area (ha)= 17.98				
ID= 1 DT=12.0 min	Total Imp(%)= 61.00	Dir. Conn.(%)= 61.00			

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	10.97	7.01	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	48.81	6.41	
over	(min)	12.00	24.00	
Storage Coeff.	(min)=	1.34 (ii)	15.32 (ii)	
Unit Hyd. Tpeak	(min)=	12.00	24.00	
Unit Hyd. peak	(cms)=	0.14	0.06	
				TOTALS
PEAK FLOW	(cms)=	1.49	0.10	1.538 (iii)
TIME TO PEAK	(hrs)=	1.40	1.60	1.40
RUNOFF VOLUME	(mm)=	23.97	4.89	16.53
TOTAL RAINFALL	(mm)=	24.97	24.97	24.97
RUNOFF COEFFICIENT	=	0.96	0.20	0.66

***** 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 (0112)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0113):		1.21	0.094	1.40	15.38
+ ID2= 2 (0114):		2.11	0.019	1.60	3.58
ID = 3 (0112):		3.32	0.109	1.40	7.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0112):		3.32	0.109	1.40	7.88
+ ID2= 2 (0115):		17.98	1.538	1.40	16.53
ID = 1 (0112):		21.30	1.647	1.40	15.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0112):		21.30	1.647	1.40	15.18
+ ID2= 2 (0084):		10.64	1.033	1.40	18.24
ID = 3 (0112):		31.94	2.679	1.40	16.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0112):		31.94	2.679	1.40	16.20
+ ID2= 2 (0085):		8.53	0.806	1.40	17.86
ID = 1 (0112):		40.47	3.486	1.40	16.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.

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                    (ha)     (cms)     (hrs)      (mm)
*** W A R N I N G :  HYDROGRAPH 0089 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
         ID1= 1 (0112):    40.47   3.486     1.40    16.55
       + ID2= 2 (0089):     0.00   0.000     0.00     0.00
         ================================================
         ID = 3 (0112):    40.47   3.486     1.40    16.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0137) |   Area     (ha)=   1.33   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.391

     PEAK FLOW       (cms)=   0.016 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=   2.955
     TOTAL RAINFALL   (mm)=  24.969
     RUNOFF COEFFICIENT   =   0.118

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0096) |   Area     (ha)=   3.62
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.01         2.61
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.14         0.04         0.156 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89         10.23
     TOTAL RAINFALL   (mm)=     24.97        24.97         24.97
     RUNOFF COEFFICIENT   =      0.96         0.20          0.41

***** 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.

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--------------------
| CALIB            |
| STANDHYD  (0138) |   Area     (ha)=   1.45
|ID= 1 DT=12.0 min |   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.93         0.52
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.13         0.01         0.130 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89         17.09
     TOTAL RAINFALL   (mm)=     24.97        24.97         24.97
     RUNOFF COEFFICIENT   =      0.96         0.20          0.68

***** 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.

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--------------------
| ADD HYD   (0136) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
         ID1= 1 (0137):     1.33   0.016     1.40     2.95
       + ID2= 2 (0138):     1.45   0.130     1.40    17.09
         ================================================
         ID = 3 (0136):     2.78   0.146     1.40    10.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0136) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
         ID1= 3 (0136):     2.78   0.146     1.40    10.33
       + ID2= 2 (0096):     3.62   0.156     1.40    10.23
         ================================================
         ID = 1 (0136):     6.40   0.302     1.40    10.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0117) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000    |  0.3260      0.8017
                          0.0790     0.1850    |  0.3960      0.9004
                          0.2270     0.3947    |  0.0000      0.0000

                              AREA     QPEAK     TPEAK        R.V.
                              (ha)     (cms)     (hrs)        (mm)
     INFLOW : ID= 2 (0136)    6.400     0.302      1.40       10.27
     OUTFLOW: ID= 1 (0117)    6.400     0.021      2.80       10.18

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.83
                TIME SHIFT OF PEAK FLOW          (min)= 84.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.0483

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--------------------
| ROUTE PIPE (0116)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter     (mm)=1650.00
| DT=  5.0 min     |     Length        (m)= 850.00
--------------------     Slope       (m/m)=  0.005
                         Manning n       =  0.013

     <------------------ TRAVEL TIME TABLE ------------------->
       DEPTH      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)     (cu.m.)       (cms)         (m/s)         min
        0.09    .367E+02         0.0          0.80         17.68
        0.17    .102E+03         0.1          1.25         11.33
        0.26    .184E+03         0.3          1.61          8.81
        0.35    .278E+03         0.6          1.91          7.41
        0.43    .382E+03         1.0          2.18          6.51
        0.52    .492E+03         1.4          2.41          5.88
        0.61    .608E+03         1.9          2.61          5.43
        0.69    .727E+03         2.4          2.79          5.08
        0.78    .848E+03         2.9          2.95          4.81
        0.87    .970E+03         3.5          3.08          4.60
        0.96    .109E+04         4.1          3.20          4.43
        1.04    .121E+04         4.7          3.29          4.31
        1.13    .133E+04         5.2          3.36          4.22
        1.22    .144E+04         5.8          3.41          4.15
        1.30    .154E+04         6.2          3.44          4.12
        1.39    .163E+04         6.6          3.43          4.13
        1.48    .172E+04         6.9          3.40          4.17
        1.56    .178E+04         6.9          3.31          4.28
        1.65    .182E+04         6.5          3.02          4.70
                                      <---- hydrograph ---->   <-pipe / channel->
                                    AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                    (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
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     INFLOW : ID= 2 (0117)    6.40     0.02     2.80  10.18      0.05      0.80
     OUTFLOW: ID= 1 (0116)    6.40     0.02     3.30  10.18      0.05      0.80


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| ADD HYD   (0111) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0112):    40.47   3.486     1.40    16.55
        + ID2= 2 (0116):     6.40   0.020     3.30    10.18
          ================================================
          ID = 3 (0111):    46.87   3.489     1.40    15.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0110) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)     |    (cms)     (ha.m.)
                         0.0000     0.0000     |    1.0010     1.0368
                         0.0410     0.1625     |    1.4640     1.1396
                         0.0970     0.4197     |    1.6230     1.3517
                         0.1600     0.6939     |    2.0260     2.0441
                         0.5090     0.8867     |    2.6870     2.2310
                         0.6570     0.9362     |    6.1640     2.6224

                              AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0111)    46.870     3.489      1.40      15.68
     OUTFLOW: ID= 1 (0110)    46.870     0.130      3.90      15.66

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.73
                TIME SHIFT OF PEAK FLOW          (min)=150.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.5633

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| DUHYD     (0144) |
| Inlet Cap.=2.787 |
| #of Inlets=    1 |
| Total(cms)=  2.8 |      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):  46.87      0.13      3.90   15.66
     ========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):  46.87      0.13      3.90   15.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| STANDHYD  (0081) |   Area    (ha)=   1.34
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.00          0.34
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      48.81          6.41
               over (min)        12.00         24.00
     Storage Coeff.  (min)=       1.34 (ii)    15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00         24.00
     Unit Hyd. peak  (cms)=       0.14          0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.14          0.00          0.139 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.60           1.40
     RUNOFF VOLUME    (mm)=      23.97          4.89          19.19
     TOTAL RAINFALL   (mm)=      24.97         24.97          24.97
     RUNOFF COEFFICIENT   =       0.96          0.20           0.77

***** 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.

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| CALIB            |
| STANDHYD  (0082) |   Area    (ha)=   2.51
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
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                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.88          0.63
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      48.81          6.41
               over (min)        12.00         24.00
     Storage Coeff.  (min)=       1.34 (ii)    15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00         24.00
     Unit Hyd. peak  (cms)=       0.14          0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26          0.01          0.260 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.60           1.40
     RUNOFF VOLUME    (mm)=      23.97          4.89          19.19
     TOTAL RAINFALL   (mm)=      24.97         24.97          24.97
     RUNOFF COEFFICIENT   =       0.96          0.20           0.77

***** 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.

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| CALIB            |
| STANDHYD  (0101) |   Area    (ha)=   0.47
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.33          0.14
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       2.00          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      48.81          6.41
               over (min)        12.00         24.00
     Storage Coeff.  (min)=       1.34 (ii)    15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00         24.00
     Unit Hyd. peak  (cms)=       0.14          0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04          0.00          0.046 (iii)
     TIME TO PEAK    (hrs)=       1.40          1.60           1.40
     RUNOFF VOLUME    (mm)=      23.97          4.89          18.23
     TOTAL RAINFALL   (mm)=      24.97         24.97          24.97
     RUNOFF COEFFICIENT   =       0.96          0.20           0.73

***** 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.

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| ADD HYD   (0088) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0101):     0.47   0.046     1.40    18.23
        + ID2= 2 (0082):     2.51   0.260     1.40    19.19
          ================================================
          ID = 3 (0088):     2.98   0.305     1.40    19.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

-------------------
| DUHYD     (0093) |
| Inlet Cap.=0.934 |
| #of Inlets=    1 |
| Total(cms)=  0.9 |      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
```

```
     TOTAL HYD.(ID= 1):   2.98      0.31      1.40   19.04
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   2.98      0.31      1.40   19.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0094) |   Area    (ha)=   2.25
|ID= 1 DT=12.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.35         0.90
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.18         0.01          0.190 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89         16.33
     TOTAL RAINFALL   (mm)=     24.97        24.97         24.97
     RUNOFF COEFFICIENT   =      0.96         0.20          0.65

***** 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  (0100) |   Area    (ha)=   1.27
|ID= 1 DT=12.0 min |   Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.86         0.41
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.12         0.01          0.120 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89         17.85
     TOTAL RAINFALL   (mm)=     24.97        24.97         24.97
     RUNOFF COEFFICIENT   =      0.96         0.20          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.

--------------------------------------------------------------------------------
--------------------
| DUHYD     (0092) |
| Inlet Cap.=0.309 |
| #of Inlets=   1  |
| Total(cms)=  0.3 |       AREA     QPEAK     TPEAK     R.V.
--------------------       (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   1.27      0.12      1.40   17.85
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   1.27      0.12      1.40   17.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0102) |   Area    (ha)=   2.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.68         2.03
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.09         0.03          0.107 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89          9.65
     TOTAL RAINFALL   (mm)=     24.97        24.97         24.97
     RUNOFF COEFFICIENT   =      0.96         0.20          0.39

***** 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  (0103) |   Area    (ha)=   5.86
|ID= 1 DT=12.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  56.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.28         2.58
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.44         0.04          0.464 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89         15.57
     TOTAL RAINFALL   (mm)=     24.97        24.97         24.97
     RUNOFF COEFFICIENT   =      0.96         0.20          0.62

***** 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   (0104) |
|   1 +  2 =  3    |         AREA    QPEAK     TPEAK     R.V.
--------------------        (ha)    (cms)     (hrs)     (mm)
          ID1= 1 (0102):    2.71    0.107     1.40      9.65
        + ID2= 2 (0103):    5.86    0.464     1.40     15.57
          ================================================
          ID = 3 (0104):    8.57    0.570     1.40     13.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| ADD HYD   (0104) |
|   3 +  2 =  1    |         AREA    QPEAK     TPEAK     R.V.
--------------------        (ha)    (cms)     (hrs)     (mm)
```

```
          ID1= 3 (0104):     8.57   0.570     1.40    13.70
        + ID2= 2 (0081):     1.34   0.139     1.40    19.19
          ================================================
          ID = 1 (0104):     9.91   0.709     1.40    14.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH 0092 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
          ID1= 1 (0104):     9.91   0.709     1.40    14.44
        + ID2= 2 (0092):     0.00   0.000     0.00     0.00
          ================================================
          ID = 3 (0104):     9.91   0.709     1.40    14.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0104):     9.91   0.709     1.40    14.44
        + ID2= 2 (0093):     2.98   0.305     1.40    19.04
          ================================================
          ID = 1 (0104):    12.89   1.014     1.40    15.51

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0104) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0104):    12.89   1.014     1.40    15.51
        + ID2= 2 (0094):     2.25   0.190     1.40    16.33
          ================================================
          ID = 3 (0104):    15.14   1.204     1.40    15.63

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0083) |   Area    (ha)=   3.28
|ID= 1 DT=12.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.30         0.98
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      48.81         6.41
               over (min)        12.00        24.00
     Storage Coeff.  (min)=       1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00        24.00
     Unit Hyd. peak  (cms)=       0.14         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.31         0.01          0.318 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=      23.97         4.89         18.24
     TOTAL RAINFALL   (mm)=      24.97        24.97         24.97
     RUNOFF COEFFICIENT   =       0.96         0.20          0.73

***** 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  (0091) |   Area    (ha)=   2.50
|ID= 1 DT=12.0 min |   Total Imp(%)=  55.00   Dir. Conn.(%)=  55.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.38         1.12
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      48.81         6.41
               over (min)        12.00        24.00
     Storage Coeff.  (min)=       1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00        24.00
     Unit Hyd. peak  (cms)=       0.14         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.02          0.195 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=      23.97         4.89         15.38
     TOTAL RAINFALL   (mm)=      24.97        24.97         24.97
     RUNOFF COEFFICIENT   =       0.96         0.20          0.62

***** 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.

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--------------------
| DUHYD     (0090) |
| Inlet Cap.=0.502 |
| #of Inlets=    1 |
| Total(cms)=  0.5 |          AREA     QPEAK     TPEAK     R.V.
--------------------          (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):    2.50      0.19      1.40    15.38
     ================================================================
     MAJOR SYS.(ID= 2):    0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):    2.50      0.19      1.40    15.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0109) |   Area    (ha)=  10.16
|ID= 1 DT=12.0 min |   Total Imp(%)=  66.00   Dir. Conn.(%)=  66.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.71         3.45
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      48.81         6.41
               over (min)        12.00        24.00
     Storage Coeff.  (min)=       1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=      12.00        24.00
     Unit Hyd. peak  (cms)=       0.14         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.91         0.05          0.934 (iii)
     TIME TO PEAK    (hrs)=       1.40         1.60          1.40
     RUNOFF VOLUME    (mm)=      23.97         4.89         17.48
     TOTAL RAINFALL   (mm)=      24.97        24.97         24.97
     RUNOFF COEFFICIENT   =       0.96         0.20          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.

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--------------------
| ADD HYD   (0107) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0109):    10.16   0.934     1.40    17.48
        + ID2= 2 (0083):     3.28   0.318     1.40    18.24
          ================================================
          ID = 3 (0107):    13.44   1.252     1.40    17.67
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	13.44	1.252	1.40	17.67
	+ ID2= 2 (0089):	1.50	0.134	1.40	17.09
	ID = 1 (0107):	14.94	1.386	1.40	17.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
1 + 3 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0107):	14.94	1.386	1.40	17.61
	+ ID2= 2 (0090):	2.50	0.195	1.40	15.38
	ID = 3 (0107):	17.44	1.581	1.40	17.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0107):	17.44	1.581	1.40	17.29
	+ ID2= 2 (0092):	1.27	0.120	1.40	17.85
	ID = 1 (0107):	18.71	1.701	1.40	17.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0106)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	0.7020	0.4603
		0.0190	0.0734	1.0110	0.9685
		0.0360	0.1913	1.0260	1.0011
		0.0460	0.2976	1.1220	1.2435
		0.5590	0.4360	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0107)	18.710	1.701	1.40	17.33
OUTFLOW: ID= 1 (0106)	18.710	0.044	4.00	17.27

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.61
TIME SHIFT OF PEAK FLOW (min)=156.00
MAXIMUM STORAGE USED (ha.m.)= 0.2802

ROUTE PIPE (0105)		
IN= 2---> OUT= 1	PIPE Number	= 1.00
DT= 5.0 min	Diameter (mm)	=1650.00
	Length (m)	= 467.00
	Slope (m/m)	= 0.006
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0106)	18.71	0.04	4.00	17.27	0.09	0.89
OUTFLOW: ID= 1 (0105)	18.71	0.04	4.10	17.27	0.09	0.89

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0104):	15.14	1.204	1.40	15.63
	+ ID2= 2 (0105):	18.71	0.044	4.10	17.27
	ID = 3 (0099):	33.85	1.221	1.40	16.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0099)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
*** W A R N I N G : HYDROGRAPH 0144 <ID= 2> IS DRY.					
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003					
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003					
	ID1= 3 (0099):	33.85	1.221	1.40	16.54
	+ ID2= 2 (0144):	0.00	0.000	0.00	0.00
	ID = 1 (0099):	33.85	1.221	1.40	16.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0098)		OUTFLOW	STORAGE	OUTFLOW	STORAGE
IN= 2---> OUT= 1		(cms)	(ha.m.)	(cms)	(ha.m.)
DT= 5.0 min		0.0000	0.0000	0.8190	1.9354
		0.0200	0.0920	0.9260	2.5967
		0.0480	0.2529	1.2030	3.3403
		0.3020	0.3889	1.2340	3.4062
		0.3520	0.4239	4.2880	3.6759
		0.7390	1.5375	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0099)	33.850	1.221	1.40	16.54
OUTFLOW: ID= 1 (0098)	33.850	0.045	4.60	16.50

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.71
TIME SHIFT OF PEAK FLOW (min)=192.00
MAXIMUM STORAGE USED (ha.m.)= 0.2375

CALIB					
NASHYD (0123)	Area	(ha)=	1.61	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)=	5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)=	0.13		

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 2.955
TOTAL RAINFALL (mm)= 24.969
RUNOFF COEFFICIENT = 0.118

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0124)	Area	(ha)=	2.59	Curve Number	(CN)= 74.0

```
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.450

     PEAK FLOW       (cms)=   0.025 (i)
     TIME TO PEAK    (hrs)=   1.600
     RUNOFF VOLUME    (mm)=   3.522
     TOTAL RAINFALL   (mm)=  24.969
     RUNOFF COEFFICIENT   =   0.141

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB           |
| STANDHYD  (0086) |   Area     (ha)=  10.18
|ID= 1 DT=12.0 min |   Total Imp(%)=  75.00   Dir. Conn.(%)=  75.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      7.63         2.55
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=      1.04         0.04      1.053 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60       1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89      19.20
     TOTAL RAINFALL   (mm)=     24.97        24.97      24.97
     RUNOFF COEFFICIENT   =      0.96         0.20       0.77

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0087) |   Area     (ha)=   2.21
|ID= 1 DT=12.0 min |   Total Imp(%)=  85.00   Dir. Conn.(%)=  85.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.88         0.33
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.25         0.00       0.257 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60       1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89      21.10
     TOTAL RAINFALL   (mm)=     24.97        24.97      24.97
     RUNOFF COEFFICIENT   =      0.96         0.20       0.85

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0097) |   Area     (ha)=   0.85
|ID= 1 DT=12.0 min |   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.24         0.61
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.03         0.01       0.037 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60       1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89      10.22
     TOTAL RAINFALL   (mm)=     24.97        24.97      24.97
     RUNOFF COEFFICIENT   =      0.96         0.20       0.41

***** 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.

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-------------------
| CALIB           |
| STANDHYD  (0125) |   Area     (ha)=   6.71
|ID= 1 DT=12.0 min |   Total Imp(%)=  80.00   Dir. Conn.(%)=  80.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      5.37         1.34
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.73         0.02       0.737 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60       1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89      20.15
     TOTAL RAINFALL   (mm)=     24.97        24.97      24.97
     RUNOFF COEFFICIENT   =      0.96         0.20       0.81

***** 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.

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-------------------
| ADD HYD   (0122) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0123):     1.61    0.019     1.40     2.95
        + ID2= 2 (0124):     2.59    0.025     1.60     3.52
          ==========================================
          ID = 3 (0122):     4.20    0.042     1.40     3.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0122) |
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0122):     4.20    0.042     1.40     3.30
        + ID2= 2 (0125):     6.71    0.737     1.40    20.15
          ==========================================
          ID = 1 (0122):    10.91    0.780     1.40    13.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0122):	10.91	0.780	1.40	13.67
	+ ID2= 2 (0086):	10.18	1.053	1.40	19.20
	ID = 3 (0122):	21.09	1.833	1.40	16.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0122):	21.09	1.833	1.40	16.34
	+ ID2= 2 (0087):	2.21	0.257	1.40	21.10
	ID = 1 (0122):	23.30	2.090	1.40	16.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0122):	23.30	2.090	1.40	16.79
	+ ID2= 2 (0097):	0.85	0.037	1.40	10.22
	ID = 3 (0122):	24.15	2.127	1.40	16.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0120)
IN= 2---> OUT= 1
DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1220	0.9070
0.0340	0.1438	0.1360	1.1803
0.0550	0.3009	0.1530	1.5887
0.0860	0.4370	2.5850	1.7557
0.0900	0.4726	10.7310	2.0518

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0122)	24.150	2.127	1.40	16.56
OUTFLOW: ID= 1 (0120)	24.150	0.064	4.00	16.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.99
TIME SHIFT OF PEAK FLOW (min)=156.00
MAXIMUM STORAGE USED (ha.m.)= 0.3391

CALIB
NASHYD (0131) | ID= 1 DT=12.0 min
Area (ha)= 6.53 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.067 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 3.437
TOTAL RAINFALL (mm)= 24.969
RUNOFF COEFFICIENT = 0.138

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0128) | ID= 1 DT=12.0 min
Area (ha)= 2.34
Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		48.81	6.41
over (min)		12.00	24.00
Storage Coeff. (min)=		1.34 (ii)	15.32 (ii)
Unit Hyd. Tpeak (min)=		12.00	24.00
Unit Hyd. peak (cms)=		0.14	0.06
			TOTALS
PEAK FLOW	(cms)=	0.17	0.01 0.182 (iii)
TIME TO PEAK	(hrs)=	1.40	1.60 1.40
RUNOFF VOLUME	(mm)=	23.97	4.89 15.38
TOTAL RAINFALL	(mm)=	24.97	24.97 24.97
RUNOFF COEFFICIENT	=	0.96	0.20 0.62

***** 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 (0130) | ID= 1 DT=12.0 min
Area (ha)= 0.97
Total Imp(%)= 64.00 Dir. Conn.(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		48.81	6.41
over (min)		12.00	24.00
Storage Coeff. (min)=		1.34 (ii)	15.32 (ii)
Unit Hyd. Tpeak (min)=		12.00	24.00
Unit Hyd. peak (cms)=		0.14	0.06
			TOTALS
PEAK FLOW	(cms)=	0.08	0.00 0.087 (iii)
TIME TO PEAK	(hrs)=	1.40	1.60 1.40
RUNOFF VOLUME	(mm)=	23.97	4.89 17.09
TOTAL RAINFALL	(mm)=	24.97	24.97 24.97
RUNOFF COEFFICIENT	=	0.96	0.20 0.68

***** 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 (0129)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0128):	2.34	0.182	1.40	15.38
	+ ID2= 2 (0130):	0.97	0.087	1.40	17.09
	ID = 3 (0129):	3.31	0.269	1.40	15.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0129)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0129):	3.31	0.269	1.40	15.88
	+ ID2= 2 (0131):	6.53	0.067	1.40	3.44
	ID = 1 (0129):	9.84	0.336	1.40	7.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0134) | Area (ha)= 0.91 Curve Number (CN)= 74.0

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|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.204

     PEAK FLOW       (cms)=   0.010 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=   3.342
     TOTAL RAINFALL   (mm)=  24.969
     RUNOFF COEFFICIENT   =   0.134

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB             |
| STANDHYD  (0095)  |   Area    (ha)=   2.95
|ID= 1 DT=12.0 min  |   Total Imp(%)=  25.00   Dir. Conn.(%)=  25.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.74         2.21
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.10         0.03      0.116 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60       1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89       9.66
     TOTAL RAINFALL   (mm)=     24.97        24.97      24.97
     RUNOFF COEFFICIENT   =      0.96         0.20       0.39

***** 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.

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-------------------
| CALIB             |
| STANDHYD  (0133)  |   Area    (ha)=   6.86
|ID= 1 DT=12.0 min  |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
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                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.18         2.68
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.57         0.04       0.587 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60       1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89      16.53
     TOTAL RAINFALL   (mm)=     24.97        24.97      24.97
     RUNOFF COEFFICIENT   =      0.96         0.20       0.66

***** 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.

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-------------------
| CALIB             |
| STANDHYD  (0135)  |   Area    (ha)=   3.87
|ID= 1 DT=12.0 min  |   Total Imp(%)=  61.00   Dir. Conn.(%)=  61.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.36         1.51
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=     48.81         6.41
               over (min)       12.00        24.00
     Storage Coeff.  (min)=      1.34 (ii)   15.32 (ii)
     Unit Hyd. Tpeak (min)=     12.00        24.00
     Unit Hyd. peak  (cms)=      0.14         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.32         0.02       0.331 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.60       1.40
     RUNOFF VOLUME    (mm)=     23.97         4.89      16.52
     TOTAL RAINFALL   (mm)=     24.97        24.97      24.97
     RUNOFF COEFFICIENT   =      0.96         0.20       0.66

***** 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.

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| ADD HYD   (0132)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0133):     6.86   0.587     1.40     16.53
        + ID2= 2 (0134):     0.91   0.010     1.40      3.34
          ==========================================================
          ID = 3 (0132):     7.77   0.597     1.40     14.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0132)  |
|   3 +  2 =  1     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0132):     7.77   0.597     1.40     14.98
        + ID2= 2 (0135):     3.87   0.331     1.40     16.52
          ==========================================================
          ID = 1 (0132):    11.64   0.928     1.40     15.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0132)  |
|   1 +  2 =  3     |          AREA    QPEAK    TPEAK     R.V.
-------------------            (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0132):    11.64   0.928     1.40     15.49
        + ID2= 2 (0095):     2.95   0.116     1.40      9.66
          ==========================================================
          ID = 3 (0132):    14.59   1.044     1.40     14.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| RESERVOIR (0127)  |
| IN= 2---> OUT= 1  |
| DT=  5.0 min      |     OUTFLOW    STORAGE    |   OUTFLOW    STORAGE
-------------------        (cms)     (ha.m.)    |    (cms)     (ha.m.)
                         0.0000      0.0000    |   0.6510      0.4563
                         0.1220      0.1110    |   0.8770      0.7650
                         0.3620      0.2096    |   0.0000      0.0000

                              AREA     QPEAK     TPEAK        R.V.
                               (ha)     (cms)     (hrs)        (mm)
     INFLOW : ID= 2 (0132)    14.590     1.044     1.40        14.31
     OUTFLOW: ID= 1 (0127)    14.590     0.160     1.90        14.30

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.32
                TIME SHIFT OF PEAK FLOW       (min)= 30.00
                MAXIMUM  STORAGE   USED      (ha.m.)=  0.1268

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ROUTE PIPE (0119)	IN= 2---> OUT= 1	DT= 12.0 min	PIPE Number = 1.00	Diameter (mm)=1650.00	Length (m)= 500.00	Slope (m/m)= 0.005	Manning n = 0.013

<TRAVEL TIME TABLE>

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46
0.61	.358E+03	1.9	2.61	3.19
0.69	.428E+03	2.4	2.79	2.99
0.78	.499E+03	2.9	2.95	2.83
0.87	.570E+03	3.5	3.08	2.70
0.96	.642E+03	4.1	3.20	2.61
1.04	.712E+03	4.7	3.29	2.53
1.13	.780E+03	5.2	3.36	2.48
1.22	.844E+03	5.8	3.41	2.44
1.30	.905E+03	6.2	3.44	2.43
1.39	.961E+03	6.6	3.43	2.43
1.48	.101E+04	6.9	3.40	2.45
1.56	.105E+04	6.9	3.31	2.52
1.65	.107E+04	6.5	3.02	2.76

	<---- hydrograph ----> AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.16	1.90	14.30	0.18	1.26
OUTFLOW: ID= 1 (0119)	14.59	0.16	2.00	14.30	0.18	1.26

ADD HYD (0118)	1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
		ID1= 1 (0119):	14.59	0.160	2.00	14.30
		+ ID2= 2 (0129):	9.84	0.336	1.40	7.62
		ID = 3 (0118):	24.43	0.380	1.40	11.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126)	IN= 2---> OUT= 1	DT= 12.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
			0.0000	0.0000	0.6510	0.4564
			0.1220	0.0863	0.8770	0.7894
			0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	0.380	1.40	11.61
OUTFLOW: ID= 1 (0126)	24.430	0.131	3.30	11.60

PEAK FLOW REDUCTION [Qout/Qin](%)= 34.54
TIME SHIFT OF PEAK FLOW (min)=114.00
MAXIMUM STORAGE USED (ha.m.)= 0.0892

ADD HYD (0155)	1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
		ID1= 1 (0120):	24.15	0.064	4.00	16.51
		+ ID2= 2 (0126):	24.43	0.131	3.30	11.60
		ID = 3 (0155):	48.58	0.195	3.30	14.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	NASHYD (0147)	ID= 1 DT= 5.0 min	Area (ha)= 1.49	Ia (mm)= 5.00	U.H. Tp(hrs)= 0.22	Curve Number (CN)= 74.0	# of Linear Res.(N)= 3.00

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	1.39	1.083	12.23	2.083	3.39	3.08	1.66
0.167	1.39	1.167	12.23	2.167	3.39	3.17	1.66
0.250	1.60	1.250	65.06	2.250	2.87	3.25	1.54
0.333	1.60	1.333	65.06	2.333	2.87	3.33	1.54
0.417	1.89	1.417	16.31	2.417	2.49	3.42	1.44
0.500	1.89	1.500	16.31	2.500	2.49	3.50	1.44
0.583	2.35	1.583	8.16	2.583	2.21	3.58	1.35
0.667	2.35	1.667	8.16	2.667	2.21	3.67	1.35
0.750	3.12	1.750	5.50	2.750	1.99	3.75	1.27
0.833	3.12	1.833	5.50	2.833	1.99	3.83	1.27
0.917	4.83	1.917	4.18	2.917	1.81	3.92	1.20
1.000	4.83	2.000	4.18	3.000	1.81	4.00	1.20

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.015 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 3.646
TOTAL RAINFALL (mm)= 24.969
RUNOFF COEFFICIENT = 0.146

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	STANDHYD (0146)	ID= 1 DT= 5.0 min	Area (ha)= 2.59	Total Imp(%)= 44.00	Dir. Conn.(%)= 44.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.14	1.45
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	30.00
Length	(m)=	20.75	10.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	65.06	10.64
over	(min)	5.00	5.00
Storage Coeff.	(min)=	0.96 (ii)	2.74 (ii)
Unit Hyd. Tpeak	(min)=	5.00	5.00
Unit Hyd. peak	(cms)=	0.34	0.28

				TOTALS
PEAK FLOW	(cms)=	0.21	0.05	0.256 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	23.97	4.89	13.28
TOTAL RAINFALL	(mm)=	24.97	24.97	24.97
RUNOFF COEFFICIENT	=	0.96	0.20	0.53

***** 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 (0148)	1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
		ID1= 1 (0146):	2.59	0.256	1.33	13.28
		+ ID2= 2 (0147):	1.49	0.015	1.58	3.65
		ID = 3 (0148):	4.07	0.262	1.33	9.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0148)	3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
		ID1= 3 (0148):	4.07	0.262	1.33	9.77
		+ ID2= 2 (0155):	48.58	0.195	3.30	14.04
		ID = 1 (0148):	52.65	0.315	1.33	13.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

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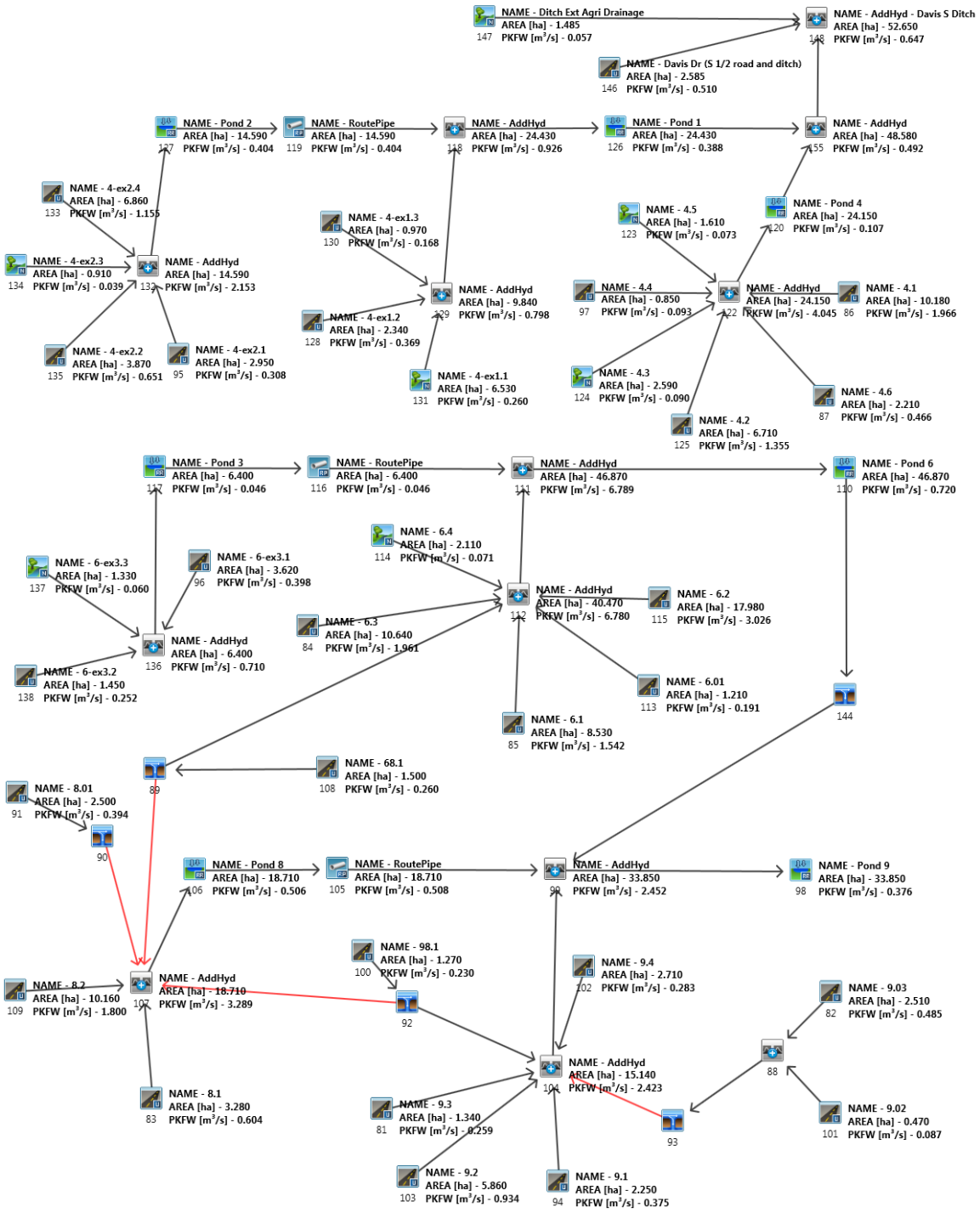
COLE ENGINEERING

Experience Enhancing Excellence

L09-301
Glenway golf course development, Newmarket, ON
5-Year 4 Hour Chicago Storm Post-Development Model Schematic
November 2013

VO2 Model Schematic



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================================================================================================
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       V    V   I    SSSSS  U   U    A    L
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        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O    Company
        OOO     T      T    H   H    Y    M   M   OOO                Serial

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                    *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual Otthymo 3.0\VO2\voin.dat
  Output  filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2834215-98a0-4e11-8546-
50c9109e2dca\Scenario.out
  Summary filename: C:\Users\DMcBrayne\AppData\Local\Temp\f2834215-98a0-4e11-8546-
50c9109e2dca\Scenario.sum


DATE: 11/20/2013                          TIME: 07:30:35

USER:


COMMENTS: _____________________________________________________


------------------------------------------------------------------------------------------------
-----
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

--------------------
| CHICAGO STORM    |     IDF curve parameters: A= 930.000
| Ptotal= 46.27 mm |                           B=   4.000
--------------------                           C=   0.798
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    = 10.00 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
                0.17    2.85  |  1.17   22.78  |   2.17    6.72  |  3.17    3.39
                0.33    3.26  |  1.33  113.21  |   2.33    5.72  |  3.33    3.14
                0.50    3.84  |  1.50   30.05  |   2.50    4.99  |  3.50    2.94
                0.67    4.72  |  1.67   15.54  |   2.67    4.45  |  3.67    2.76
                0.83    6.21  |  1.83   10.66  |   2.83    4.02  |  3.83    2.61
                1.00    9.42  |  2.00    8.20  |   3.00    3.67  |  4.00    2.47


------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0114) |    Area     (ha)=   2.11   Curve Number    (CN)= 74.0
|ID= 1 DT=12.0 min |    Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.26

        NOTE:  RAINFALL WAS TRANSFORMED TO  12.0 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
               0.200    2.92  | 1.200   37.85  | 2.200    6.55  |  3.20    3.35
               0.400    3.45  | 1.400   85.49  | 2.400    5.48  |  3.40    3.08
               0.600    4.28  | 1.600   22.80  | 2.600    4.72  |  3.60    2.85
               0.800    5.71  | 1.800   12.29  | 2.800    4.16  |  3.80    2.66
               1.000    8.88  | 2.000    8.61  | 3.000    3.73  |  4.00    2.49

    Unit Hyd Qpeak  (cms)=   0.310

    PEAK FLOW       (cms)=   0.071 (i)
    TIME TO PEAK    (hrs)=   1.600
    RUNOFF VOLUME    (mm)=  12.794
    TOTAL RAINFALL   (mm)=  46.267
    RUNOFF COEFFICIENT   =   0.277

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0084) |    Area     (ha)=  10.64
|ID= 1 DT=12.0 min |    Total Imp(%)=  70.00   Dir. Conn.(%)=  70.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=          7.45          3.19
    Dep. Storage     (mm)=          1.00          1.50
    Average Slope     (%)=          2.00          2.00
    Length            (m)=         30.00         20.00
    Mannings n           =         0.013         0.250

    Max.Eff.Inten.(mm/hr)=         85.49         27.73
              over (min)           12.00         12.00
    Storage Coeff.  (min)=          1.07 (ii)     8.85 (ii)
    Unit Hyd. Tpeak (min)=         12.00         12.00
    Unit Hyd. peak  (cms)=          0.14          0.11
                                                          *TOTALS*
    PEAK FLOW       (cms)=          1.77          0.19      1.961 (iii)
    TIME TO PEAK    (hrs)=          1.40          1.40      1.40
    RUNOFF VOLUME    (mm)=         45.27         14.95     36.17
    TOTAL RAINFALL   (mm)=         46.27         46.27     46.27
    RUNOFF COEFFICIENT   =          0.98          0.32      0.78

***** 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  (0085) |    Area     (ha)=   8.53
|ID= 1 DT=12.0 min |    Total Imp(%)=  68.00   Dir. Conn.(%)=  68.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=          5.80          2.73
    Dep. Storage     (mm)=          1.00          1.50
    Average Slope     (%)=          2.00          2.00
    Length            (m)=         30.00         20.00
    Mannings n           =         0.013         0.250

    Max.Eff.Inten.(mm/hr)=         85.49         27.73
              over (min)           12.00         12.00
    Storage Coeff.  (min)=          1.07 (ii)     8.85 (ii)
    Unit Hyd. Tpeak (min)=         12.00         12.00
    Unit Hyd. peak  (cms)=          0.14          0.11
                                                          *TOTALS*
    PEAK FLOW       (cms)=          1.38          0.16      1.542 (iii)
    TIME TO PEAK    (hrs)=          1.40          1.40      1.40
    RUNOFF VOLUME    (mm)=         45.27         14.95     35.57
    TOTAL RAINFALL   (mm)=         46.27         46.27     46.27
    RUNOFF COEFFICIENT   =          0.98          0.32      0.77

***** 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  (0108) |    Area     (ha)=   1.50
|ID= 1 DT=12.0 min |    Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=          0.96          0.54
    Dep. Storage     (mm)=          1.00          1.50
    Average Slope     (%)=          2.00          2.00
    Length            (m)=         30.00         20.00
    Mannings n           =         0.013         0.250
```

Max.Eff.Inten.(mm/hr)=	85.49	27.73		
over (min)	12.00	12.00		
Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)		
Unit Hyd. Tpeak (min)=	12.00	12.00		
Unit Hyd. peak (cms)=	0.14	0.11		
			TOTALS	
PEAK FLOW (cms)=	0.23	0.03	0.260 (iii)	
TIME TO PEAK (hrs)=	1.40	1.40	1.40	
RUNOFF VOLUME (mm)=	45.27	14.95	34.35	
TOTAL RAINFALL (mm)=	46.27	46.27	46.27	
RUNOFF COEFFICIENT =	0.98	0.32	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.

DUHYD (0089)
Inlet Cap.=0.350
#of Inlets= 1
Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.50	0.26	1.40	34.35
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.50	0.26	1.40	34.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0113) Area (ha)= 1.21
ID= 1 DT=12.0 min Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.67	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	85.49	27.73		
over (min)	12.00	12.00		
Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)		
Unit Hyd. Tpeak (min)=	12.00	12.00		
Unit Hyd. peak (cms)=	0.14	0.11		
			TOTALS	
PEAK FLOW (cms)=	0.16	0.03	0.191 (iii)	
TIME TO PEAK (hrs)=	1.40	1.40	1.40	
RUNOFF VOLUME (mm)=	45.27	14.95	31.62	
TOTAL RAINFALL (mm)=	46.27	46.27	46.27	
RUNOFF COEFFICIENT =	0.98	0.32	0.68	

***** 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 (0115) Area (ha)= 17.98
ID= 1 DT=12.0 min Total Imp(%)= 61.00 Dir. Conn.(%)= 61.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	10.97	7.01
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	85.49	27.73	
over (min)	12.00	12.00	
Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=	12.00	12.00	
Unit Hyd. peak (cms)=	0.14	0.11	
			TOTALS
PEAK FLOW (cms)=	2.60	0.42	3.026 (iii)
TIME TO PEAK (hrs)=	1.40	1.40	1.40
RUNOFF VOLUME (mm)=	45.27	14.95	33.44
TOTAL RAINFALL (mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT =	0.98	0.32	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 (0112)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0113):	1.21	0.191	1.40	31.62
+ ID2= 2 (0114):	2.11	0.071	1.60	12.79
ID = 3 (0112):	3.32	0.251	1.40	19.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	3.32	0.251	1.40	19.66
+ ID2= 2 (0115):	17.98	3.026	1.40	33.44
ID = 1 (0112):	21.30	3.278	1.40	31.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0112):	21.30	3.278	1.40	31.30
+ ID2= 2 (0084):	10.64	1.961	1.40	36.17
ID = 3 (0112):	31.94	5.238	1.40	32.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0112):	31.94	5.238	1.40	32.92
+ ID2= 2 (0085):	8.53	1.542	1.40	35.57
ID = 1 (0112):	40.47	6.780	1.40	33.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0112)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0089 <ID= 2> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001				
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001				
ID1= 1 (0112):	40.47	6.780	1.40	33.48
+ ID2= 2 (0089):	0.00	0.000	0.00	0.00
ID = 3 (0112):	40.47	6.780	1.40	33.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0137) Area (ha)= 1.33 Curve Number (CN)= 74.0

```
|ID= 1 DT=12.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.13

     Unit Hyd Qpeak  (cms)=   0.391

     PEAK FLOW       (cms)=   0.060 (i)
     TIME TO PEAK    (hrs)=   1.400
     RUNOFF VOLUME    (mm)=  10.559
     TOTAL RAINFALL   (mm)=  46.267
     RUNOFF COEFFICIENT   =   0.228

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD  (0096)|   Area    (ha)=   3.62
|ID= 1 DT=12.0 min|   Total Imp(%)=  28.00   Dir. Conn.(%)=  28.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.01         2.61
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     85.49        27.73
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.24         0.16          0.398 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=     45.27        14.95          23.44
     TOTAL RAINFALL   (mm)=     46.27        46.27          46.27
     RUNOFF COEFFICIENT   =      0.98         0.32           0.51

***** 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  (0138)|   Area    (ha)=   1.45
|ID= 1 DT=12.0 min|   Total Imp(%)=  64.00   Dir. Conn.(%)=  64.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.93         0.52
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     30.00        20.00
     Mannings n          =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     85.49        27.73
               over (min)       12.00        12.00
     Storage Coeff.  (min)=      1.07 (ii)    8.85 (ii)
     Unit Hyd. Tpeak (min)=     12.00        12.00
     Unit Hyd. peak  (cms)=      0.14         0.11
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.22         0.03          0.252 (iii)
     TIME TO PEAK    (hrs)=      1.40         1.40           1.40
     RUNOFF VOLUME    (mm)=     45.27        14.95          34.35
     TOTAL RAINFALL   (mm)=     46.27        46.27          46.27
     RUNOFF COEFFICIENT   =      0.98         0.32           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   (0136)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0137):     1.33   0.060     1.40    10.56
        + ID2= 2 (0138):     1.45   0.252     1.40    34.35
          ================================================
          ID = 3 (0136):     2.78   0.312     1.40    22.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| ADD HYD   (0136)|
|   3 +  2 =  1   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0136):     2.78   0.312     1.40    22.97
        + ID2= 2 (0096):     3.62   0.398     1.40    23.44
          ================================================
          ID = 1 (0136):     6.40   0.710     1.40    23.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0117)|
| IN= 2---> OUT= 1|
| DT=  5.0 min    |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000    |  0.3260      0.8017
                         0.0790     0.1850    |  0.3960      0.9004
                         0.2270     0.3947    |  0.0000      0.0000

                              AREA     QPEAK     TPEAK        R.V.
                               (ha)     (cms)     (hrs)        (mm)
     INFLOW : ID= 2 (0136)    6.400     0.710      1.40       23.24
     OUTFLOW: ID= 1 (0117)    6.400     0.046      2.90       23.14

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.53
                  TIME SHIFT OF PEAK FLOW         (min)= 90.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.1086

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-------------------
| ROUTE PIPE (0116)|     PIPE Number      =   1.00
| IN= 2---> OUT= 1 |     Diameter    (mm)=1650.00
| DT=  5.0 min     |     Length       (m)= 850.00
-------------------      Slope      (m/m)=  0.005
                         Manning n        =  0.013

     <------------------ TRAVEL TIME TABLE ---------------------->
       DEPTH       VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)       (cu.m.)       (cms)         (m/s)         min
       0.09     .367E+02        0.0           0.80         17.68
       0.17     .102E+03        0.1           1.25         11.33
       0.26     .184E+03        0.3           1.61          8.81
       0.35     .278E+03        0.6           1.91          7.41
       0.43     .382E+03        1.0           2.18          6.51
       0.52     .492E+03        1.4           2.41          5.88
       0.61     .608E+03        1.9           2.61          5.43
       0.69     .727E+03        2.4           2.79          5.08
       0.78     .848E+03        2.9           2.95          4.81
       0.87     .970E+03        3.5           3.08          4.60
       0.96     .109E+04        4.1           3.20          4.43
       1.04     .121E+04        4.7           3.29          4.31
       1.13     .133E+04        5.2           3.36          4.22
       1.22     .144E+04        5.8           3.41          4.15
       1.30     .154E+04        6.2           3.44          4.12
       1.39     .163E+04        6.6           3.43          4.13
       1.48     .172E+04        6.9           3.40          4.17
       1.56     .178E+04        6.9           3.31          4.28
       1.65     .182E+04        6.5           3.02          4.70
                                      <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK    TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)    (hrs)   (mm)       (m)      (m/s)
     INFLOW : ID= 2 (0117)    6.40     0.05     2.90  23.14       0.10      0.83
     OUTFLOW: ID= 1 (0116)    6.40     0.05     3.20  23.14       0.10      0.83

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-------------------
| ADD HYD   (0111)|
|   1 +  2 =  3   |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0112):    40.47   6.780     1.40    33.48
        + ID2= 2 (0116):     6.40   0.046     3.20    23.14
          ================================================
          ID = 3 (0111):    46.87   6.789     1.40    32.07
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0110)		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1		0.0000	0.0000	1.0010	1.0368
DT= 5.0 min		0.0410	0.1625	1.4640	1.1396
		0.0970	0.4197	1.6230	1.3517
		0.1600	0.6939	2.0260	2.0441
		0.5090	0.8867	2.6870	2.2310
		0.6570	0.9362	6.1640	2.6224

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0111)	46.870	6.789	1.40	32.07
OUTFLOW: ID= 1 (0110)	46.870	0.720	2.10	32.04

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.61
TIME SHIFT OF PEAK FLOW (min)= 42.00
MAXIMUM STORAGE USED (ha.m.)= 0.9555

DUHYD (0144)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
Inlet Cap.=2.787					
#of Inlets= 1					
Total(cms)= 2.8	TOTAL HYD.(ID= 1):	46.87	0.72	2.10	32.04
	MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
	MINOR SYS.(ID= 3):	46.87	0.72	2.10	32.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0081)	Area (ha)= 1.34				
ID= 1 DT=12.0 min	Total Imp(%)= 75.00	Dir. Conn.(%)= 75.00			
		IMPERVIOUS	PERVIOUS (i)		
	Surface Area (ha)=	1.00	0.34		
	Dep. Storage (mm)=	1.00	1.50		
	Average Slope (%)=	2.00	2.00		
	Length (m)=	30.00	20.00		
	Mannings n =	0.013	0.250		
	Max.Eff.Inten.(mm/hr)=	85.49	27.73		
	over (min)	12.00	12.00		
	Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)		
	Unit Hyd. Tpeak (min)=	12.00	12.00		
	Unit Hyd. peak (cms)=	0.14	0.11		
					TOTALS
	PEAK FLOW (cms)=	0.24	0.02		0.259 (iii)
	TIME TO PEAK (hrs)=	1.40	1.40		1.40
	RUNOFF VOLUME (mm)=	45.27	14.95		37.68
	TOTAL RAINFALL (mm)=	46.27	46.27		46.27
	RUNOFF COEFFICIENT =	0.98	0.32		0.81

***** 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 (0082)	Area (ha)= 2.51				
ID= 1 DT=12.0 min	Total Imp(%)= 75.00	Dir. Conn.(%)= 75.00			
		IMPERVIOUS	PERVIOUS (i)		
	Surface Area (ha)=	1.88	0.63		
	Dep. Storage (mm)=	1.00	1.50		
	Average Slope (%)=	2.00	2.00		
	Length (m)=	30.00	20.00		
	Mannings n =	0.013	0.250		
	Max.Eff.Inten.(mm/hr)=	85.49	27.73		
	over (min)	12.00	12.00		
	Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)		
	Unit Hyd. Tpeak (min)=	12.00	12.00		
	Unit Hyd. peak (cms)=	0.14	0.11		
					TOTALS
	PEAK FLOW (cms)=	0.45	0.04		0.485 (iii)
	TIME TO PEAK (hrs)=	1.40	1.40		1.40
	RUNOFF VOLUME (mm)=	45.27	14.95		37.69
	TOTAL RAINFALL (mm)=	46.27	46.27		46.27
	RUNOFF COEFFICIENT =	0.98	0.32		0.81

***** 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 (0101)	Area (ha)= 0.47				
ID= 1 DT=12.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 70.00			
		IMPERVIOUS	PERVIOUS (i)		
	Surface Area (ha)=	0.33	0.14		
	Dep. Storage (mm)=	1.00	1.50		
	Average Slope (%)=	2.00	2.00		
	Length (m)=	30.00	20.00		
	Mannings n =	0.013	0.250		
	Max.Eff.Inten.(mm/hr)=	85.49	27.73		
	over (min)	12.00	12.00		
	Storage Coeff. (min)=	1.07 (ii)	8.85 (ii)		
	Unit Hyd. Tpeak (min)=	12.00	12.00		
	Unit Hyd. peak (cms)=	0.14	0.11		
					TOTALS
	PEAK FLOW (cms)=	0.08	0.01		0.087 (iii)
	TIME TO PEAK (hrs)=	1.40	1.40		1.40
	RUNOFF VOLUME (mm)=	45.27	14.95		36.17
	TOTAL RAINFALL (mm)=	46.27	46.27		46.27
	RUNOFF COEFFICIENT =	0.98	0.32		0.78

***** 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 (0088)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0101):	0.47	0.087	1.40	36.17
	+ ID2= 2 (0082):	2.51	0.485	1.40	37.69
	ID = 3 (0088):	2.98	0.571	1.40	37.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0093)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
Inlet Cap.=0.934					
#of Inlets= 1					
Total(cms)= 0.9	TOTAL HYD.(ID= 1):	2.98	0.57	1.40	37.45
	MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
	MINOR SYS.(ID= 3):	2.98	0.57	1.40	37.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0094)	Area (ha)= 2.25				
ID= 1 DT=12.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00			
		IMPERVIOUS	PERVIOUS (i)		
	Surface Area (ha)=	1.35	0.90		

Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.32	0.05	0.375 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	33.14
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	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.

CALIB STANDHYD (0100) ID= 1 DT=12.0 min | Area (ha)= 1.27 Total Imp(%)= 68.00 Dir. Conn.(%)= 68.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.86	0.41
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		85.49	27.73
over (min)		12.00	12.00
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.11
			TOTALS
PEAK FLOW	(cms)=	0.21	0.02	0.230 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	35.56
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.77

***** 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.

DUHYD (0092) Inlet Cap.=0.309 #of Inlets= 1 Total(cms)= 0.3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.27	0.23	1.40	35.56
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.27	0.23	1.40	35.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0102) ID= 1 DT=12.0 min | Area (ha)= 2.71 Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	2.03
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		85.49	27.73
over (min)		12.00	12.00
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.11
			TOTALS
PEAK FLOW	(cms)=	0.16	0.12	0.283 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	22.53
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.49

***** 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 (0103) ID= 1 DT=12.0 min | Area (ha)= 5.86 Total Imp(%)= 56.00 Dir. Conn.(%)= 56.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.28	2.58
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		85.49	27.73
over (min)		12.00	12.00
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak (min)=		12.00	12.00
Unit Hyd. peak (cms)=		0.14	0.11
			TOTALS
PEAK FLOW	(cms)=	0.78	0.16	0.934 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	31.93
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.69

***** 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 (0104) 1 + 2 = 3

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):		2.71	0.283	1.40	22.53
+ ID2= 2 (0103):		5.86	0.934	1.40	31.93
ID = 3 (0104):		8.57	1.218	1.40	28.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104) 3 + 2 = 1

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0104):		8.57	1.218	1.40	28.96
+ ID2= 2 (0081):		1.34	0.259	1.40	37.68
ID = 1 (0104):		9.91	1.476	1.40	30.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104) 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

*** W A R N I N G : HYDROGRAPH 0092 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001

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*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
         ID1= 1 (0104):     9.91   1.476     1.40    30.14
       + ID2= 2 (0092):     0.00   0.000     0.00     0.00
         ================================================
         ID = 3 (0104):     9.91   1.476     1.40    30.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (0104)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0104):	9.91	1.476	1.40	30.14
+ ID2= 2 (0093):	2.98	0.571	1.40	37.45
ID = 1 (0104):	12.89	2.048	1.40	31.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0104)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0104):	12.89	2.048	1.40	31.83
+ ID2= 2 (0094):	2.25	0.375	1.40	33.14
ID = 3 (0104):	15.14	2.423	1.40	32.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0083) | Area (ha)= 3.28
ID= 1 DT=12.0 min | Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.30	0.98	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.55	0.06	0.604 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	36.17
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.78

***** 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 (0091) | Area (ha)= 2.50
ID= 1 DT=12.0 min | Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.38	1.12	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.33	0.07	0.394 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	31.62
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.68

***** 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.

DUHYD (0090)
Inlet Cap.=0.502
#of Inlets= 1
Total(cms)= 0.5

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	2.50	0.39	1.40	31.62
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	2.50	0.39	1.40	31.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0109) | Area (ha)= 10.16
ID= 1 DT=12.0 min | Total Imp(%)= 66.00 Dir. Conn.(%)= 66.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	6.71	3.45	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	1.59	0.21	1.800 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	34.96
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.76

***** 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 (0107)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0109):	10.16	1.800	1.40	34.96
+ ID2= 2 (0083):	3.28	0.604	1.40	36.17
ID = 3 (0107):	13.44	2.405	1.40	35.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0107):	13.44	2.405	1.40	35.26
+ ID2= 2 (0089):	1.50	0.260	1.40	34.35
ID = 1 (0107):	14.94	2.665	1.40	35.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0107):	14.94	2.665	1.40	35.16
+ ID2= 2 (0090):	2.50	0.394	1.40	31.62
ID = 3 (0107):	17.44	3.059	1.40	34.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0107)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0107):	17.44	3.059	1.40	34.66
+ ID2= 2 (0092):	1.27	0.230	1.40	35.56
ID = 1 (0107):	18.71	3.289	1.40	34.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0106)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.7020	0.4603
0.0190	0.0734	1.0110	0.9685
0.0360	0.1913	1.0260	1.0011
0.0460	0.2976	1.1220	1.2435
0.5590	0.4360	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0107)	18.710	3.289	1.40	34.72
OUTFLOW: ID= 1 (0106)	18.710	0.506	1.90	34.67

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.38
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.4223

ROUTE PIPE (0105)
IN= 2---> OUT= 1
DT= 5.0 min

PIPE Number = 1.00
Diameter (mm)=1650.00
Length (m)= 467.00
Slope (m/m)= 0.006
Manning n = 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.201E+02	0.0	0.88	8.87
0.17	.560E+02	0.2	1.37	5.68
0.26	.101E+03	0.4	1.76	4.42
0.35	.153E+03	0.7	2.09	3.72
0.43	.210E+03	1.1	2.38	3.27
0.52	.270E+03	1.5	2.64	2.95
0.61	.334E+03	2.0	2.86	2.72
0.69	.399E+03	2.6	3.06	2.55
0.78	.466E+03	3.2	3.23	2.41
0.87	.533E+03	3.9	3.38	2.31
0.96	.599E+03	4.5	3.50	2.22
1.04	.665E+03	5.1	3.60	2.16
1.13	.728E+03	5.7	3.68	2.11
1.22	.789E+03	6.3	3.74	2.08
1.30	.846E+03	6.8	3.76	2.07
1.39	.897E+03	7.2	3.76	2.07
1.48	.943E+03	7.5	3.72	2.09
1.56	.978E+03	7.6	3.63	2.15
1.65	.999E+03	7.1	3.30	2.36

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0106)	18.71	0.51	1.90	34.67	0.30	1.88
OUTFLOW: ID= 1 (0105)	18.71	0.51	1.90	34.67	0.30	1.89

ADD HYD (0099)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0104):	15.14	2.423	1.40	32.02
+ ID2= 2 (0105):	18.71	0.508	1.90	34.67
ID = 3 (0099):	33.85	2.452	1.40	33.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0099)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0144 <ID= 2> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003				
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003				
ID1= 3 (0099):	33.85	2.452	1.40	33.48
+ ID2= 2 (0144):	0.00	0.000	0.00	0.00
ID = 1 (0099):	33.85	2.452	1.40	33.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0098)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8190	1.9354
0.0200	0.0920	0.9260	2.5967
0.0480	0.2529	1.2030	3.3403
0.3020	0.3889	1.2340	3.4062
0.3520	0.4239	4.2880	3.6759
0.7390	1.5375	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0099)	33.850	2.452	1.40	33.48
OUTFLOW: ID= 1 (0098)	33.850	0.376	3.20	33.45

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.34
TIME SHIFT OF PEAK FLOW (min)=108.00
MAXIMUM STORAGE USED (ha.m.)= 0.4934

CALIB
NASHYD (0123)
ID= 1 DT=12.0 min

Area (ha)= 1.61 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.13

Unit Hyd Qpeak (cms)= 0.473

PEAK FLOW (cms)= 0.073 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 10.559
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.228

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
NASHYD (0124)
ID= 1 DT=12.0 min

Area (ha)= 2.59 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.450

PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 12.586
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.272

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0086)	Area (ha)= 10.18		
ID= 1 DT=12.0 min	Total Imp(%)= 75.00	Dir. Conn.(%)= 75.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	7.63	2.55	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	1.81	0.15	1.966 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	37.69
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.81

***** 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 (0087)	Area (ha)= 2.21		
ID= 1 DT=12.0 min	Total Imp(%)= 85.00	Dir. Conn.(%)= 85.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.88	0.33	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.45	0.02	0.466 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	40.72
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.88

***** 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 (0097)	Area (ha)= 0.85		
ID= 1 DT=12.0 min	Total Imp(%)= 28.00	Dir. Conn.(%)= 28.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.24	0.61	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.06	0.04	0.093 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	23.44
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.51

***** 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 (0125)	Area (ha)= 6.71		
ID= 1 DT=12.0 min	Total Imp(%)= 80.00	Dir. Conn.(%)= 80.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	5.37	1.34	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
				TOTALS
PEAK FLOW	(cms)=	1.27	0.08	1.355 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	39.20
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.85

***** 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 (0122)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0123):	1.61	0.073	1.40	10.56
	+ ID2= 2 (0124):	2.59	0.090	1.40	12.59
	ID = 3 (0122):	4.20	0.164	1.40	11.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0122):	4.20	0.164	1.40	11.81
	+ ID2= 2 (0125):	6.71	1.355	1.40	39.20
	ID = 1 (0122):	10.91	1.519	1.40	28.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0122):	10.91	1.519	1.40	28.66
	+ ID2= 2 (0086):	10.18	1.966	1.40	37.69
	ID = 3 (0122):	21.09	3.485	1.40	33.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0122):		21.09	3.485	1.40	33.02
+ ID2= 2 (0087):		2.21	0.466	1.40	40.72
ID = 1 (0122):		23.30	3.951	1.40	33.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0122)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0122):		23.30	3.951	1.40	33.75
+ ID2= 2 (0097):		0.85	0.093	1.40	23.44
ID = 3 (0122):		24.15	4.045	1.40	33.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0120)				
IN= 2---> OUT= 1				
DT= 12.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1220	0.9070
	0.0340	0.1438	0.1360	1.1803
	0.0550	0.3009	0.1530	1.5887
	0.0860	0.4370	2.5850	1.7557
	0.0900	0.4726	10.7310	2.0518

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0122)	24.150	4.045	1.40	33.38
OUTFLOW: ID= 1 (0120)	24.150	0.107	4.00	33.34

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.64
TIME SHIFT OF PEAK FLOW (min)=156.00
MAXIMUM STORAGE USED (ha.m.)= 0.7010

CALIB					
NASHYD (0131)	Area	(ha)=	6.53	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)=	5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)=	0.19		

Unit Hyd Qpeak (cms)= 1.313

PEAK FLOW (cms)= 0.260 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 12.283
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.265

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0128)	Area	(ha)=	2.34		
ID= 1 DT=12.0 min	Total Imp	(%)=	55.00	Dir. Conn.	(%)= 55.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	1.05
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	85.49	27.73
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.31	0.06	0.369 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	31.62
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.68

***** 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 (0130)	Area	(ha)=	0.97		
ID= 1 DT=12.0 min	Total Imp	(%)=	64.00	Dir. Conn.	(%)= 64.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	30.00	20.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.	(mm/hr)=	85.49	27.73
over	(min)	12.00	12.00
Storage Coeff.	(min)=	1.07 (ii)	8.85 (ii)
Unit Hyd. Tpeak	(min)=	12.00	12.00
Unit Hyd. peak	(cms)=	0.14	0.11

				TOTALS
PEAK FLOW	(cms)=	0.15	0.02	0.168 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	34.35
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	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 (0129)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0128):		2.34	0.369	1.40	31.62
+ ID2= 2 (0130):		0.97	0.168	1.40	34.35
ID = 3 (0129):		3.31	0.537	1.40	32.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0129)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0129):		3.31	0.537	1.40	32.42
+ ID2= 2 (0131):		6.53	0.260	1.40	12.28
ID = 1 (0129):		9.84	0.798	1.40	19.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0134)	Area	(ha)=	0.91	Curve Number	(CN)= 74.0
ID= 1 DT=12.0 min	Ia	(mm)=	5.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)=	0.17		

Unit Hyd Qpeak (cms)= 0.204

PEAK FLOW (cms)= 0.039 (i)
TIME TO PEAK (hrs)= 1.400
RUNOFF VOLUME (mm)= 11.943
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.258

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0095)	Area (ha)= 2.95		
ID= 1 DT=12.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 25.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.74	2.21	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
			TOTALS	
PEAK FLOW	(cms)=	0.18	0.13	0.308 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	22.53
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.49

***** 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 (0133)	Area (ha)= 6.86		
ID= 1 DT=12.0 min	Total Imp(%)= 61.00	Dir. Conn.(%)= 61.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	4.18	2.68	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
			TOTALS	
PEAK FLOW	(cms)=	0.99	0.16	1.155 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	33.44
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	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.

CALIB			
STANDHYD (0135)	Area (ha)= 3.87		
ID= 1 DT=12.0 min	Total Imp(%)= 61.00	Dir. Conn.(%)= 61.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	2.36	1.51	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	30.00	20.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		85.49	27.73	
over (min)		12.00	12.00	
Storage Coeff. (min)=		1.07 (ii)	8.85 (ii)	
Unit Hyd. Tpeak (min)=		12.00	12.00	
Unit Hyd. peak (cms)=		0.14	0.11	
			TOTALS	
PEAK FLOW	(cms)=	0.56	0.09	0.651 (iii)
TIME TO PEAK	(hrs)=	1.40	1.40	1.40
RUNOFF VOLUME	(mm)=	45.27	14.95	33.44
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	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 (0132)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0133):	6.86	1.155	1.40	33.44	
+ ID2= 2 (0134):	0.91	0.039	1.40	11.94	
ID = 3 (0132):	7.77	1.194	1.40	30.93	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0132):	7.77	1.194	1.40	30.93	
+ ID2= 2 (0135):	3.87	0.651	1.40	33.44	
ID = 1 (0132):	11.64	1.845	1.40	31.76	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0132)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0132):	11.64	1.845	1.40	31.76	
+ ID2= 2 (0095):	2.95	0.308	1.40	22.53	
ID = 3 (0132):	14.59	2.153	1.40	29.90	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0127)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.6510	0.4563
	0.1220	0.1110	0.8770	0.7650
	0.3620	0.2096	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0132)	14.590	2.153	1.40	29.90
OUTFLOW: ID= 1 (0127)	14.590	0.404	1.80	29.88

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.78
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.2459

ROUTE PIPE (0119)		
IN= 2---> OUT= 1	PIPE Number	= 1.00
DT= 12.0 min	Diameter (mm)	=1650.00
	Length (m)	= 500.00
	Slope (m/m)	= 0.005
	Manning n	= 0.013

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME min
0.09	.216E+02	0.0	0.80	10.40
0.17	.600E+02	0.1	1.25	6.67
0.26	.108E+03	0.3	1.61	5.18
0.35	.164E+03	0.6	1.91	4.36
0.43	.225E+03	1.0	2.18	3.83
0.52	.290E+03	1.4	2.41	3.46

0.61	.358E+03	1.9	2.61	3.19	
0.69	.428E+03	2.4	2.79	2.99	
0.78	.499E+03	2.9	2.95	2.83	
0.87	.570E+03	3.5	3.08	2.70	
0.96	.642E+03	4.1	3.20	2.61	
1.04	.712E+03	4.7	3.29	2.53	
1.13	.780E+03	5.2	3.36	2.48	
1.22	.844E+03	5.8	3.41	2.44	
1.30	.905E+03	6.2	3.44	2.43	
1.39	.961E+03	6.6	3.43	2.43	
1.48	.101E+04	6.9	3.40	2.45	
1.56	.105E+04	6.9	3.31	2.52	
1.65	.107E+04	6.5	3.02	2.76	

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0127)	14.59	0.40	1.80	29.88	0.28	1.66
OUTFLOW: ID= 1 (0119)	14.59	0.40	1.90	29.88	0.28	1.66

ADD HYD (0118)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0119):	14.59	0.404	1.90	29.88
+ ID2= 2 (0129):	9.84	0.798	1.40	19.06
ID = 3 (0118):	24.43	0.926	1.40	25.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0126)
IN= 2---> OUT= 1
DT= 12.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6510	0.4564
0.1220	0.0863	0.8770	0.7894
0.3620	0.1603	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0118)	24.430	0.926	1.40	25.52
OUTFLOW: ID= 1 (0126)	24.430	0.388	2.80	25.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 41.85
TIME SHIFT OF PEAK FLOW (min)= 84.00
MAXIMUM STORAGE USED (ha.m.)= 0.1866

ADD HYD (0155)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0120):	24.15	0.107	4.00	33.34
+ ID2= 2 (0126):	24.43	0.388	2.80	25.51
ID = 3 (0155):	48.58	0.492	2.90	29.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0147)
ID= 1 DT= 5.0 min

Area (ha)= 1.49 Curve Number (CN)= 74.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	2.85	1.083	22.78	2.083	6.72	3.08	3.39
0.167	2.85	1.167	22.78	2.167	6.72	3.17	3.39
0.250	3.26	1.250	113.21	2.250	5.72	3.25	3.14
0.333	3.26	1.333	113.21	2.333	5.72	3.33	3.14
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.583	4.72	1.583	15.54	2.583	4.45	3.58	2.76
0.667	4.72	1.667	15.54	2.667	4.45	3.67	2.76
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.61
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.61
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.057 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 13.031
TOTAL RAINFALL (mm)= 46.267
RUNOFF COEFFICIENT = 0.282

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0146)
ID= 1 DT= 5.0 min

Area (ha)= 2.59
Total Imp(%)= 44.00 Dir. Conn.(%)= 44.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.14	1.45	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	2.00	30.00	
Length	(m)=	20.75	10.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		113.21	32.36	
over (min)		5.00	5.00	
Storage Coeff. (min)=		0.77 (ii)	2.20 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.34	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.36	0.15	0.510 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	45.27	14.95	28.29
TOTAL RAINFALL	(mm)=	46.27	46.27	46.27
RUNOFF COEFFICIENT	=	0.98	0.32	0.61

***** 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 (0148)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0146):	2.59	0.510	1.33	28.29
+ ID2= 2 (0147):	1.49	0.057	1.50	13.03
ID = 3 (0148):	4.07	0.541	1.33	22.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0148)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0148):	4.07	0.541	1.33	22.72
+ ID2= 2 (0155):	48.58	0.492	2.90	29.40
ID = 1 (0148):	52.65	0.647	1.33	28.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

APPENDIX H

Proposed Pond Quality Control, Permanent Pool Sizing, Forebay Sizing

COLE ENGINEERING

Quality Pond Sizing:
Pond 4 - Post

Glenway Estates
File No. L09-301
Date: November 2013

Quality Pond Sizing

	Drainage Area			
$A_{to\text{-}pond}$ =	24.15	ha	Percent Impervious	65%
$V_{permanent\ pool}$ =	4204	m^3	Percent Pervious	35%
$V_{extended\ detention}$ =	966	m^3		

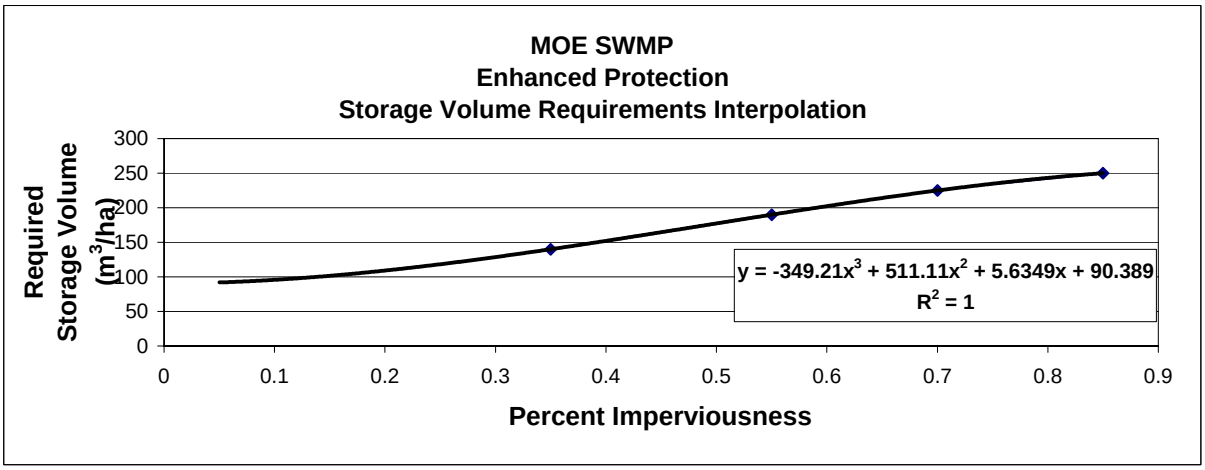
Storage Volume:	V =	214	m^3 / ha
Extended Detention:	V =	40	m^3 / ha
Permanent Pool:	V =	174	m^3 / ha

therefore, provide extended detention storage of 966 m^3
and permanent pool volume of 4204 m^3

MOE 2003 SWMP Manual: Water Quality Storage Requirements based on Receiving Waters *

PROTECTION LEVEL	SWMP Type	STORAGE VOLUME (m^3 / ha) FOR IMPERVIOUS LEVEL				
		35%	55%	70%	65.0%	85%
Enhanced	Wet Pond	140	190	225	**214**	250
Normal	Wet Pond	90	110	130		150
Basic	Wet Pond	60	75	85		95

* Table 3.2 from the MOE SWMP Planning & Design Manual, 2004, pg 3-10



COLE ENGINEERING

Stage - Storage Calculations
Pond 4 Permanent Pool

Town of Newmarket
L09-301
November 2013

Input Data **Output Volume**

	Depth	Area		Elevation
1	0.00	720		267.20
2	0.50	1193	438.8	267.70
3	1.50	2289	1997.2	268.70
4	2.50	5187	5252.2	269.70

SEGMENT VOLUME

478.25	438.8333	438.83
1741	1558.333	1997.17
3738	3255	5252.17

CHECKING

ELEV	h	Vcalc'd
262.60	0.000	0
264.10	1.500	1997
264.60	2.000	3353
265.10	2.500	5252

Matrix Calculation

1	1	0	878	
2	2	3	1997	
3	6	16	5252	
1	1	0	878	
0	-2	-3	-681	
0	-5	-15	-3058	
1	1	0	878	
0	-2	-3	-681	
0	0	-8	-1184	
1	1	0	878	
0	1	2	454	
0	0	1	158	
1	1	0	838	
0	1	0	138	
0	0	1	158	
1	0	0	**769.1**	**=a**
0	1	0	**138.1**	**=b**
0	0	1	**157.8**	**=c**

Depth (m)	Elevation (m)	Volume (m^3)
0.00	267.20	0.0
0.10	267.30	78.5
0.20	267.40	160.6
0.30	267.50	247.4
0.40	267.60	339.9
0.50	267.70	438.8
0.60	267.80	545.3
0.70	267.90	660.2
0.80	268.00	784.5
0.90	268.10	919.2
1.00	268.20	1065.1
1.10	268.30	1223.3
1.20	268.40	1394.6
1.30	268.50	1580.1
1.40	268.60	1780.6
1.50	268.70	1997.2
1.60	268.80	2230.7
1.70	268.90	2482.1
1.80	269.00	2752.4
1.90	269.10	3042.5
2.00	269.20	3353.4
2.10	269.30	3686.0
2.20	269.40	4041.2
2.30	269.50	4420.0
2.40	269.60	4823.3
2.50	269.70	5252.2

Forebay Sizing
Pond 4 West Forebay
Town of Newmarket
L09-301
Date: November 2013

Forebay Sizing

Settling Calculations

Proposed Forebay Length	**60**	**m**	water line
Proposed Forebay Width	**5**	**m**	bottom width

$$Dist = \sqrt{\frac{rQ_P}{V_S}}$$

Eq. 4.5 MOE SWM Planning and Design Manual, 2003

Water Quality Design Flow Rate from Pond (Q_p)	0.04	m^3/s	(25 mm, 4 Hour Chicago)
Length to Width Ratio of Forebay (r)	12.0	:1	
Settling Velocity (V_s)	0.0003	m/s	
Minimum Forebay Length for Settling	**37.4**	**m**	
Settling Velocity Achieved in 60m x 5m Forebay	**0.00012**	**m/s**	

The 60 m long forebay exceeds the minimum 37.4 m settling length and achieves a settling velocity of 0.00012 m/s, which is less than the maximum settling velocity of 0.0003 m/s in a proposed forebay.

Dispersion Length Calculations

$$Dist = \frac{8Q}{dV_F}$$

Eq. 4.6 MOE SWM Planning and Design Manual, 2003

Inlet Flowrate (Q)	2.02	m^3/s	(5 Year, 4 Hour Chicago)
Permanent Pool Depth in Forebay	2	m	
Desired velocity of fluid jet in forebay (V_f)	0.5	m/s	
Minimum Dispersion Length	**16.2**	**m**	
Minimum Bottom Width	**2.0**	**m**	

The proposed forebay meets all minimum size requirements for achieving desired velocities.

Achieved velocity of 5 yr inlet flow in forebay	**0.13**	**m/s**

The proposed forebay has a 5 year inlet velocity of 0.13 m/s, therefore it is less than the desired maximum velocity of 0.5 m/s in a proposed forebay.

COLE ENGINEERING

Forebay Sizing
Pond 4 East Forebay
Town of Newmarket
L09-301
Date: November, 2013

Forebay Sizing

Settling Calculations

Proposed Forebay Length	**90**	**m**	water line
Proposed Forebay Width	**5**	**m**	bottom width

$$Dist = \sqrt{\frac{rQ_P}{V_S}}$$

Eq. 4.5 MOE SWM Planning and Design Manual, 2003

Water Quality Design Flow Rate from Pond (Q_p)	0.04	m^3/s	(25 mm, 4 Hour Chicago)
Length to Width Ratio of Forebay (r)	18.0	:1	
Settling Velocity (V_s)	0.0003	m/s	
Minimum Forebay Length for Settling	**45.8**	**m**	
Settling Velocity Achieved in 90m x 5m Forebay	**0.00008**	**m/s**	

The 90 m long forebay exceeds the minimum 45.8 m settling length and achieves a settling velocity of 0.00008 m/s, which is less than the maximum settling velocity of 0.0003 m/s in a proposed forebay.

Dispersion Length Calculations

$$Dist = \frac{8Q}{dV_F}$$

Eq. 4.6 MOE SWM Planning and Design Manual, 2003

Inlet Flowrate (Q)	2.02	m^3/s	(5 Year, 4 Hour Chicago)
Permanent Pool Depth in Forebay	1	m	
Desired velocity of fluid jet in forebay (V_f)	0.5	m/s	
Minimum Dispersion Length	**32.3**	**m**	
Minimum Bottom Width	**4.0**	**m**	

The proposed forebay meets all minimum size requirements for achieving desired velocities.

Achieved velocity of 5 yr inlet flow in forebay	**0.18**	**m/s**

The proposed forebay has a 5 year inlet velocity of 0.18 m/s, therefore it is less than the desired maximum velocity of 0.5 m/s in a proposed forebay.

Worksheet for SWM Pond 4 Spillway

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		4.86	m^3/s
Crest Elevation		0.00	m
Tailwater Elevation		0.00	m
Crest Surface Type	Paved		
Crest Breadth		6.00	m
Crest Length		25.00	m

Results

Headwater Elevation	0.24	m
Headwater Height Above Crest	0.24	m
Tailwater Height Above Crest	0.00	m
Weir Coefficient	1.67	SI
Submergence Factor	1.00	
Adjusted Weir Coefficient	1.67	SI
Flow Area	5.95	m^2
Velocity	0.82	m/s
Wetted Perimeter	25.48	m
Top Width	25.00	m

Cross Section for SWM Pond 4 Spillway

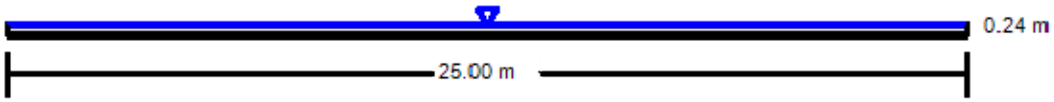
Project Description

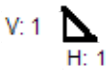
Solve For	Headwater Elevation

Input Data

Discharge		4.86	m³/s
Headwater Elevation		0.24	m
Crest Elevation		0.00	m
Tailwater Elevation		0.00	m
Crest Surface Type	Paved		
Crest Breadth		6.00	m
Crest Length		25.00	m

Cross Section Image





Culvert Calculator Report
Emergency Culvert - Pond 4

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	272.31 m	Headwater Depth/Height	1.00		
Computed Headwater Elev	272.31 m	Discharge	1.3482	m³/s	
Inlet Control HW Elev.	272.30 m	Tailwater Elevation	0.00	m	
Outlet Control HW Elev.	272.31 m	Control Type	Entrance Control		

Grades					
Upstream Invert	271.70 m	Downstream Invert	271.50	m	
Length	20.50 m	Constructed Slope	0.010000	m/m	

Hydraulic Profile					
Profile	S2	Depth, Downstream	0.30	m	
Slope Type	Steep	Normal Depth	0.30	m	
Flow Regime	Supercritical	Critical Depth	0.38	m	
Velocity Downstream	2.43 m/s	Critical Slope	0.005131	m/m	

Section					
Section Shape	Box	Mannings Coefficient	0.013		
Section Material	Concrete	Span	0.91	m	
Section Size	910 x 610 mm	Rise	0.61	m	
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	272.31 m	Upstream Velocity Head	0.19	m	
Ke	0.20	Entrance Loss	0.04	m	

Inlet Control Properties					
Inlet Control HW Elev.	272.30 m	Flow Control	Unsubmerged		
Inlet Type	90° headwall w 45° bevels	Area Full	1.1	m²	
K	0.49500	HDS 5 Chart	10		
M	0.66700	HDS 5 Scale	2		
C	0.03140	Equation Form	2		
Y	0.82000				

COLE ENGINEERING

Quality Pond Sizing:
Pond 6 - Post

Glenway Estates
File No. L09-301
Date: November 2013

Quality Pond Sizing

	Drainage Area			
$A_{to\text{-}pond}$ =	43.23	ha	Percent Impervious	66%
$V_{permanent\ pool}$ =	7624	m^3	Percent Pervious	34%
$V_{extended\ detention}$ =	1729	m^3		

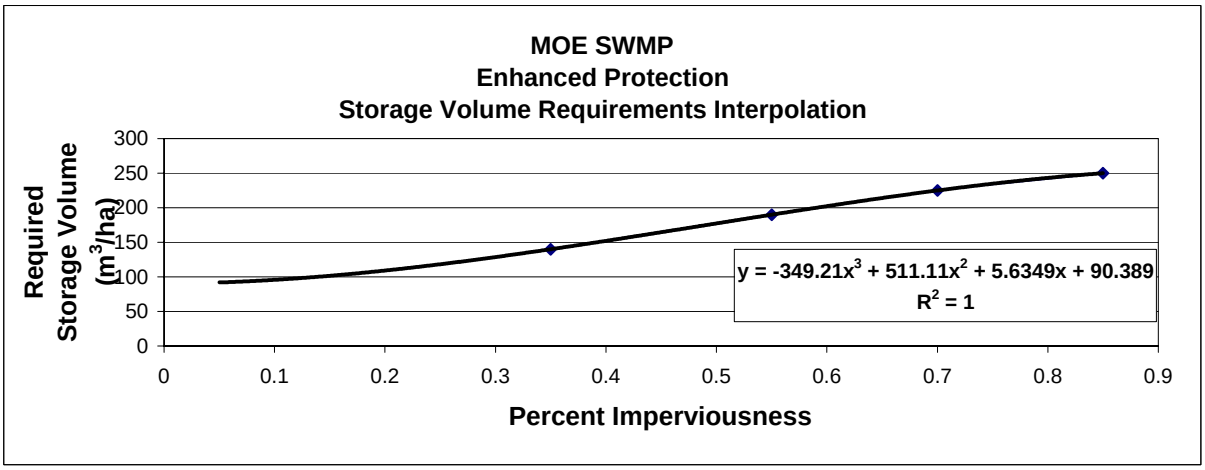
Storage Volume:	V =	216	m^3 / ha
Extended Detention:	V =	40	m^3 / ha
Permanent Pool:	V =	176	m^3 / ha

therefore, provide extended detention storage of 1729 m^3
and permanent pool volume of 7624 m^3

MOE 2003 SWMP Manual: Water Quality Storage Requirements based on Receiving Waters *

PROTECTION LEVEL	SWMP Type	STORAGE VOLUME (m^3 / ha) FOR IMPERVIOUS LEVEL				
		35%	55%	66.0%	70%	85%
Enhanced	Wet Pond	140	190	**216**	225	250
Normal	Wet Pond	90	110		130	150
Basic	Wet Pond	60	75		85	95

* Table 3.2 from the MOE SWMP Planning & Design Manual, 2004, pg 3-10



COLE ENGINEERING

Stage - Storage Calculations
Pond 6 Permanent Pool

Town of Newmarket
L09-301
November 2013

Input Data **Output Volume** **Matrix Calculation**

	Depth	Area		Elevation
1	0.00	3304		263.10
2	1.00	5027	3878.4	264.10
3	1.50	6094	6569.8	264.60
4	2.00	7869	9912.6	265.10

SEGMENT VOLUME

4165.54	3878.387	3878.39
2780.318	2691.378	6569.77
3490.705	3342.848	9912.61

CHECKING

ELEV	h	Vcalc'd
262.60	0.000	0
264.10	1.500	6570
264.60	2.000	9913
264.60	2.000	9913

1	1	1	3878	
2	2	3	6570	
2	4	8	9913	
1	1	1	3878	
0	-1	-2	-752	
0	-2	-6	-2156	
1	1	1	3878	
0	-1	-2	-752	
0	0	-1	-113	
1	1	1	3878	
0	1	3	1003	
0	0	1	150	
1	1	0	3728	
0	1	0	628	
0	0	1	150	
1	0	0	**3100.5**	**=a**
0	1	0	**627.9**	**=b**
0	0	1	**150.0**	**=c**

Depth (m)	Elevation (m)	Volume (m^3)
0.00	263.10	0.0
0.10	263.20	316.5
0.20	263.30	646.4
0.30	263.40	990.7
0.40	263.50	1350.3
0.50	263.60	1726.0
0.60	263.70	2118.7
0.70	263.80	2529.5
0.80	263.90	2959.0
0.90	264.00	3408.4
1.00	264.10	3878.4
1.10	264.20	4369.9
1.20	264.30	4884.0
1.30	264.40	5421.3
1.40	264.50	5983.0
1.50	264.60	6569.8
1.60	264.70	7182.6
1.70	264.80	7822.4
1.80	264.90	8490.1
1.90	265.00	9186.5
2.00	265.10	9912.6
2.10	265.20	10669.3
2.20	265.30	11457.4
2.30	265.40	12277.8
2.40	265.50	13131.6
2.50	265.60	14019.4

Forebay Sizing
Pond 6 Forebay
Town of Newmarket
L09-301
Date: November 2013

Forebay Sizing

Settling Calculations

Proposed Forebay Length	**60 m**	water line
Proposed Forebay Width	**18 m**	bottom width

$$Dist = \sqrt{\frac{rQ_P}{V_S}}$$

Eq. 4.5 MOE SWM Planning and Design Manual, 2003

Water Quality Design Flow Rate from Pond (Q_p)	0.12 m^3/s	(25 mm, 4 Hour Chicago)
Length to Width Ratio of Forebay (r)	3.3 :1	
Settling Velocity (V_s)	0.00030 m/s	
Minimum Forebay Length for Settling	**36.2 m**	
Settling Velocity Achieved in 46m x 9m Forebay	**0.00011 m/s**	

The 60 m long forebay exceeds the minimum 36.2 m settling length and achieves a settling velocity of 0.00011 m/s, which is less than the maximum settling velocity of 0.0003 m/s in a proposed forebay.

Dispersion Length Calculations

$$Dist = \frac{8Q}{dV_F}$$

Eq. 4.6 MOE SWM Planning and Design Manual, 2003

Inlet Flowrate (Q)	6.79 m^3/s	(5 Year, 4 Hour Chicago)
Permanent Pool Depth in Forebay	2 m	
Desired velocity of fluid jet in forebay (V_f)	0.5 m/s	
Minimum Dispersion Length	**54.3 m**	
Minimum Bottom Width	**6.8 m**	

The proposed forebay meets all minimum size requirements for achieving desired velocities.

Achieved velocity of 5 yr inlet flow in forebay	**0.5 m/s**

The proposed forebay has a 5 year inlet velocity of 0.5 m/s, which is equal to the desired maximum velocity of 0.5 m/s in a proposed forebay.

Worksheet for SWM Pond 6 Spillway

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		4.84	m^3/s
Crest Elevation		0.00	m
Tailwater Elevation		0.00	m
Crest Surface Type	Paved		
Crest Breadth		8.00	m
Crest Length		15.00	m

Results

Headwater Elevation	0.33	m
Headwater Height Above Crest	0.33	m
Tailwater Height Above Crest	0.00	m
Weir Coefficient	1.68	SI
Submergence Factor	1.00	
Adjusted Weir Coefficient	1.68	SI
Flow Area	5.00	m^2
Velocity	0.97	m/s
Wetted Perimeter	15.67	m
Top Width	15.00	m

Cross Section for SWM Pond 6 Spillway

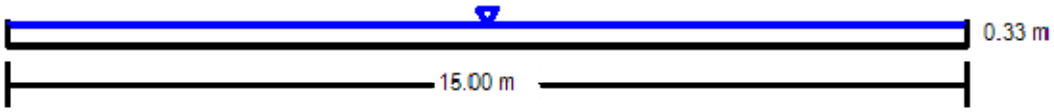
Project Description

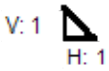
Solve For	Headwater Elevation

Input Data

Discharge		4.84	m³/s
Headwater Elevation		0.33	m
Crest Elevation		0.00	m
Tailwater Elevation		0.00	m
Crest Surface Type	Paved		
Crest Breadth		8.00	m
Crest Length		15.00	m

Cross Section Image





COLE ENGINEERING

Quality Pond Sizing
Pond 8 - Post

Glenway Estates
File No. L09-301
Date: November 2013

Quality Pond Sizing

	Drainage Area			
$A_{to\text{-}pond}$ =	17.21	ha	Percent Impervious	65%
$V_{permanent\ pool}$ =	2996	m^3	Percent Pervious	35%
$V_{extended\ detention}$ =	688	m^3		

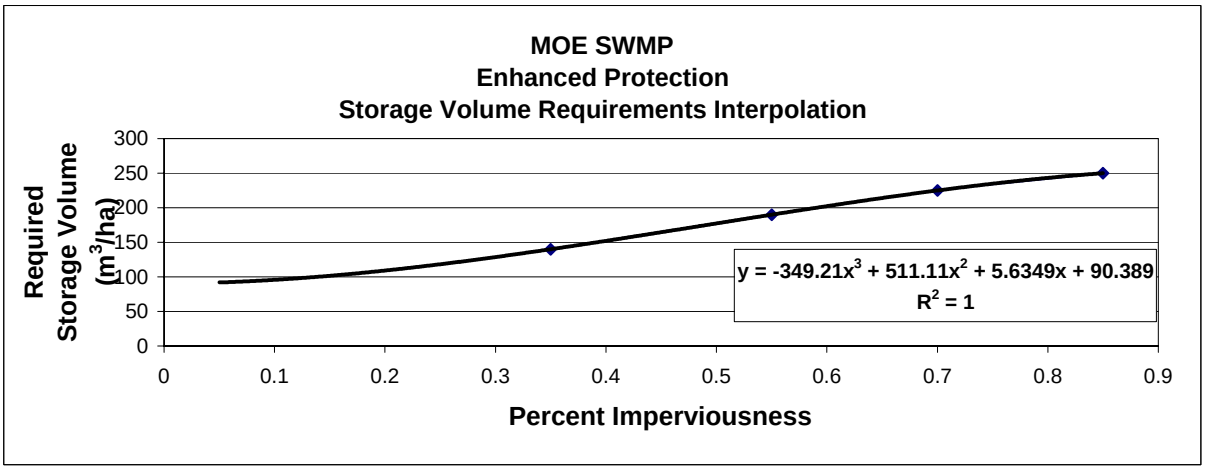
Storage Volume:	V =	214	m^3 / ha
Extended Detention:	V =	40	m^3 / ha
Permanent Pool:	V =	174	m^3 / ha

therefore, provide extended detention storage of 688 m^3
and permanent pool volume of 2996 m^3

MOE 2003 SWMP Manual: Water Quality Storage Requirements based on Receiving Waters *

PROTECTION LEVEL	SWMP Type	STORAGE VOLUME (m^3 / ha) FOR IMPERVIOUS LEVEL				
		35%	55%	65.0%	70%	85%
Enhanced	Wet Pond	140	190	**214**	225	250
Normal	Wet Pond	90	110		130	150
Basic	Wet Pond	60	75		85	95

* Table 3.2 from the MOE SWMP Planning & Design Manual, 2004, pg 3-10



COLE ENGINEERING

Stage - Storage Calculations
Pond 8 Permanent Pool
Town of Newmarket
L09-301
November 2013

Input Data **Output Volume** **Matrix Calculation**

	Depth	Area		Elevation
1	0.00	718		267.40
2	1.50	1849	1641.9	268.90
3	2.00	2488	2672.8	267.90
4	2.50	3497	4085.0	269.90

SEGMENT VOLUME

1924.665	1641.885	1641.89
1084.168	1030.89	2672.78
1496.273	1412.182	4084.96

CHECKING

ELEV	h	Vcalc'd
262.60	0.000	0
264.10	1.500	1642
264.60	2.000	2673
265.10	2.500	4085

1	2	2	1095	
2	4	8	2673	
3	6	16	4085	
1	2	2	1095	
0	-1	-4	-484	
0	-3	-10	-1348	
1	2	2	1095	
0	-1	-4	-484	
0	0	-1	-139	
1	2	2	1095	
0	1	4	484	
0	0	1	112	
1	2	0	844	
0	1	0	93	
0	0	1	112	
1	0	0	**704.0**	**=a**
0	1	0	**93.0**	**=b**
0	0	1	**111.6**	**=c**

Depth (m)	Elevation (m)	Volume (m^3)
0.00	267.40	0.0
0.10	267.50	71.4
0.20	267.60	145.4
0.30	267.70	222.6
0.40	267.80	303.6
0.50	267.90	389.2
0.60	268.00	480.0
0.70	268.10	576.6
0.80	268.20	679.9
0.90	268.30	790.3
1.00	268.40	908.6
1.10	268.50	1035.5
1.20	268.60	1171.6
1.30	268.70	1317.5
1.40	268.80	1474.1
1.50	268.90	1641.9
1.60	269.00	1821.6
1.70	269.10	2013.8
1.80	269.20	2219.4
1.90	269.30	2438.8
2.00	269.40	2672.8
2.10	269.50	2922.0
2.20	269.60	3187.2
2.30	269.70	3469.0
2.40	269.80	3768.0
2.50	269.90	4085.0

COLE ENGINEERING

Forebay Sizing
Pond 8 Forebay
Town of Newmarket
L09-301
Date: November, 2013

Forebay Sizing

Settling Calculations

Proposed Forebay Length	**36**	**m**	water line
Proposed Forebay Width	**15**	**m**	bottom width

$$Dist = \sqrt{\frac{rQ_P}{V_S}}$$

Eq. 4.5 MOE SWM Planning and Design Manual, 2003

Water Quality Design Flow Rate from Pond (Q_p)	0.04	m^3/s	(25 mm, 4 Hour Chicago)
Length to Width Ratio of Forebay (r)	2.4	:1	
Settling Velocity (V_s)	0.0003	m/s	
Minimum Forebay Length for Settling	**18.8**	**m**	
Settling Velocity Achieved in 36m x 15m Forebay	**0.00008**	**m/s**	

The 36 m long forebay exceeds the minimum 18.8 m settling length and achieves a settling velocity of 0.00008 m/s, which is less than the minimum settling velocity of 0.0003 m/s in a proposed forebay.

Dispersion Length Calculations

$$Dist = \frac{8Q}{dV_F}$$

Eq. 4.6 MOE SWM Planning and Design Manual, 2003

Inlet Flowrate (Q)	3.29	m^3/s	(5 Year,4 Hour Chicago)
Permanent Pool Depth in Forebay	2.5	m	
Desired velocity of fluid jet in forebay (V_f)	0.5	m/s	
Minimum Dispersion Length	**21.0**	**m**	
Minimum Bottom Width	**2.6**	**m**	

The proposed forebay meets all minimum size requirements for achieving desired velocities.

Achieved velocity of 5 yr inlet flow in forebay	**0.3**	**m/s**

The proposed forebay has a 5 year inlet velocity of 0.3 m/s, therefore it is less than the desired maximum velocity of 0.5 m/s in a proposed forebay.

COLE ENGINEERING

Quality Pond Sizing:
Pond 9 - Post

Glenway Estates
File No. L09-301
Date: November 2013

Quality Pond Sizing

	Drainage Area			
$A_{to\text{-}pond}$ =	15.14	ha	Percent Impervious	67%
$V_{permanent\ pool}$ =	2704	m^3	Percent Pervious	33%
$V_{extended\ detention}$ =	606	m^3		

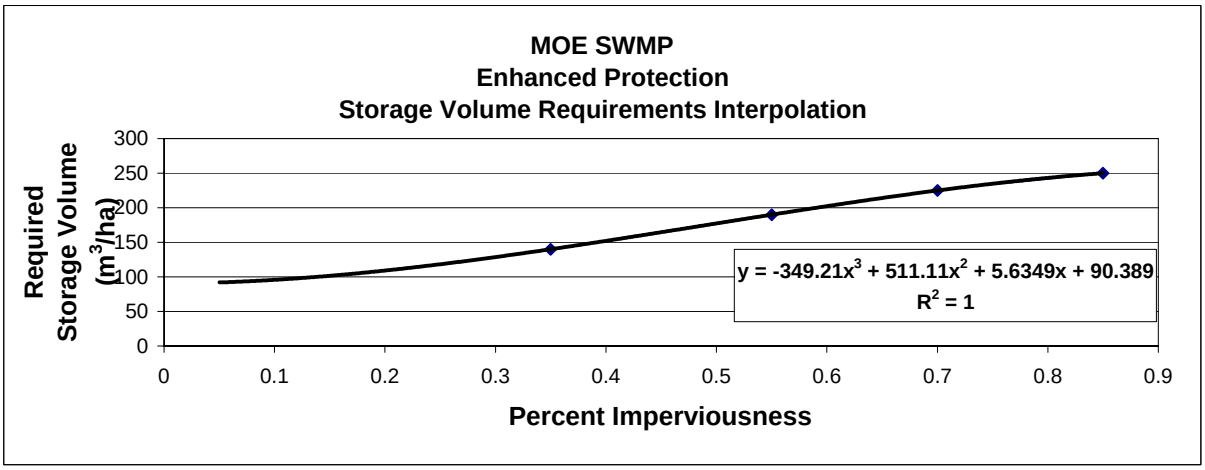
Storage Volume:	V =	219	m^3/ ha
Extended Detention:	V =	40	m^3/ ha
Permanent Pool:	V =	179	m^3/ ha

therefore, provide extended detention storage of 606 m^3
and permanent pool volume of 2704 m^3

MOE 2003 SWMP Manual: Water Quality Storage Requirements based on Receiving Waters *

PROTECTION LEVEL	SWMP Type	STORAGE VOLUME (m^3 / ha) FOR IMPERVIOUS LEVEL				
		35%	55%	67.0%	70%	85%
Enhanced	Wet Pond	140	190	**219**	225	250
Normal	Wet Pond	90	110		130	150
Basic	Wet Pond	60	75		85	95

* Table 3.2 from the MOE SWMP Planning & Design Manual, 2004, pg 3-10



COLE ENGINEERING

Stage - Storage Calculations
Pond 9 Permanent Pool
Town of Newmarket
L09-301
November 2013

Input Data

	Depth	Area
1	0.00	2207
2	1.50	4445
3	1.70	5016
4	2.00	5931

Output Volume

	Elevation
	262.45
4429.4	263.95
5356.4	264.15
6952.6	264.45

SEGMENT VOLUME

4989.008	4429.35	4429.35
946.109	927.094	5356.44
1641.942	1596.205	6952.65

CHECKING

ELEV	h	Vcalc'd
262.60	0.000	0
264.10	1.500	4429
264.60	2.000	6953
264.60	2.000	6953

Matrix Calculation

1	2	2	2953	
2	3	5	5356	
2	4	8	6953	
1	2	2	2953	
0	0	-1	-337	
0	-1	-4	-1047	
1	2	2	2953	
0	0	-1	-337	
0	0	0	-19	
1	2	2	2953	
0	1	3	990	
0	0	1	190	
1	2	0	2525	
0	1	0	381	
0	0	1	190	
1	0	0	**1953.6**	**=a**
0	1	0	**380.7**	**=b**
0	0	1	**190.3**	**=c**

Depth (m)	Elevation (m)	Volume (m^3)
0.00	262.45	0.0
0.10	262.55	199.4
0.20	262.65	407.5
0.30	262.75	625.5
0.40	262.85	854.5
0.50	262.95	1095.8
0.60	263.05	1350.3
0.70	263.15	1619.4
0.80	263.25	1904.0
0.90	263.35	2205.4
1.00	263.45	2524.6
1.10	263.55	2863.0
1.20	263.65	3221.4
1.30	263.75	3601.2
1.40	263.85	4003.5
1.50	263.95	4429.4
1.60	264.05	4880.0
1.70	264.15	5356.4
1.80	264.25	5860.0
1.90	264.35	6391.6
2.00	264.45	6952.6
2.10	264.55	7544.1
2.20	264.65	8167.2
2.30	264.75	8822.9
2.40	264.85	9512.6
2.50	264.95	10237.3

COLE ENGINEERING

Forebay Sizing
Pond 9 Forebay
Town of Newmarket
L09-301
Date: November, 2013

Forebay Sizing

Settling Calculations

Proposed Forebay Length	**35**	**m**	water line
Proposed Forebay Width	**11**	**m**	bottom width

$$Dist = \sqrt{\frac{rQ_P}{V_S}}$$

Eq. 4.5 MOE SWM Planning and Design Manual, 2003

Water Quality Design Peak Flow Rate from Pond (Q_p)	0.05	m^3/s	(25 mm, 4 Hour Chicago)
Length to Width Ratio of Forebay (r)	3.2	:1	
Settling Velocity (V_s)	0.00030	m/s	
Minimum Forebay Length for Settling	**21.8**	**m**	
Settling Velocity Achieved in 25m x 3m Forebay	**0.00012**	**m/s**	

The 35 m long forebay exceeds the minimum 21.8 m settling length and achieves a settling velocity of 0.00012 m/s, which is less than the minimum settling velocity of 0.0003 m/s in a proposed forebay.

Dispersion Length Calculations

$$Dist = \frac{8Q}{dV_F}$$

Eq. 4.6 MOE SWM Planning and Design Manual, 2003

Inlet Flowrate (Q)	2.45	m^3/s	(5 Year, 4 Hour Chicago)
Permanent Pool Depth in Forebay	2	m	
Desired velocity of fluid jet in forebay (V_f)	0.5	m/s	
Minimum Dispersion Length	**19.6**	**m**	
Minimum Bottom Width	**2.5**	**m**	

The proposed forebay meets all minimum size requirements for achieving desired velocities.

Achieved velocity of 5 yr inlet flow in forebay	**0.3**	**m/s**

The proposed forebay has a 5 year inlet velocity of 0.3 m/s, therefore it is less than the desired maximum velocity of 0.5 m/s in a proposed forebay.

Worksheet for SWM Pond 9 Spillway

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	m/m
Discharge	1.64	m³/s

Section Definitions

Station (m)	Elevation (m)
0+00	268.15
0+04	267.85
0+18	268.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 268.15)	(0+18, 268.10)	0.030

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.25	m
Elevation Range	267.85 to 268.15 m	
Flow Area	2.16	m²
Wetted Perimeter	16.90	m
Hydraulic Radius	0.13	m
Top Width	16.88	m
Normal Depth	0.25	m
Critical Depth	0.22	m
Critical Slope	0.01851	m/m
Velocity	0.76	m/s

Worksheet for SWM Pond 9 Spillway

Results

Velocity Head		0.03	m
Specific Energy		0.28	m
Froude Number		0.68	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.25	m
Critical Depth	0.22	m
Channel Slope	0.00800	m/m
Critical Slope	0.01851	m/m

Cross Section for SWM Pond 9 Spillway

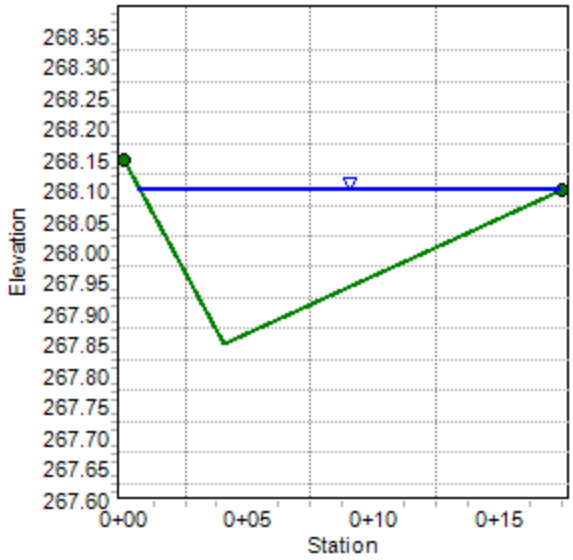
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	m/m
Normal Depth	0.25	m
Discharge	1.64	m^3/s

Cross Section Image



APPENDIX I
Phosphorus Loading

Ontario

MINISTRY OF THE ENVIRONMENT

Database Version: V 1.5 Release Update
Update Date: 16-Jan-12

Project DEVELOPMENT Summary

DEVELOPMENT: L09-301 Marianneville
Subwatershed: West Holland

Pre-Development Landuse	Area (ha)	P coeff (kg/ha)	Pload (kg/yr)
Hay-Pasture	2.025	0.12	0.24
High Intensity - Comm/Industria	9.817	1.82	17.87
High Intensity - Residential	47.757	1.32	63.04
Open Water	1.464	0.26	0.38
Sod Farm / Golf Course	36.957	0.24	8.87

Total Pre-Developed Area (ha): **98.0200**

Total Pre-Developed Phosphorus Load (kg/yr): **90.40**

POST-DEVELOPMENT EXPORT

Post-Development Landuse	Area (ha)	P coeff (kg/ha)	Best Management Practice applied with Reduction Potential		Pload (kg/yr)
Hay-Pasture	1.529	0.12	Wet Detention Ponds	63%	0.07
e 80% of phosphorus" as per LSRCA Technical Guidelines for Stormwater Management Submissions November 2010.					
High Intensity - Comm/Industria	9.681	1.82	Wet Detention Ponds	63%	6.52
e 80% of phosphorus" as per LSRCA Technical Guidelines for Stormwater Management Submissions November 2010.					
High Intensity - Residential	0	1.32	NONE	0%	0.00
High Intensity - Residential	73.729	1.32	Wet Detention Ponds	63%	36.01
e 80% of phosphorus" as per LSRCA Technical Guidelines for Stormwater Management Submissions November 2010.					
Open Water	4.49	0.26	Wet Detention Ponds	63%	0.43
e 80% of phosphorus" as per LSRCA Technical Guidelines for Stormwater Management Submissions November 2010.					
Sod Farm / Golf Course	8.59	0.24	Wet Detention Ponds	63%	0.76
e 80% of phosphorus" as per LSRCA Technical Guidelines for Stormwater Management Submissions November 2010.					

PostDeveloped Area Altered:	**98.02**	Pre-Developed Phosphorus EXPORT:	**90.40**
Total PreDeveloped Area:	**98.02**	Post-Developed EXPORT (without BMP):	**118.35**
Unaffected Area:	**0**	Post-Developed EXPORT (with BMP):	**43.79**
		Total Phosphorus Reduction Potential:	**46.6**
			(kg/year)

DEVELOPMENT: L09-301 Marianneville
Subwatershed: West Holland

CONSTRUCTION EXPORT

Total Pre-Developed Phosphorus Load (kg/yr):	**90**
Construction Phase Total Load (kg) :	to be determined
Construction Phase Ammortized Annual Load Over 8 years (kg/yr) :	to be determined
Post Development Total Load (kg/yr) :	**44**

Total Load (kg/yr): Post Development + Construction

Conclusion: **Net Reduction in Load**

APPENDIX J

Town of Newmarket Engineering Design Criteria Summary

Toronto Region Conservation Authority SWM Design Criteria - Table C 2

drainage areas and/or in-stream works to neighbouring private properties must be adequately addressed. Written permission from affected Landowners must be sought in cases where acknowledged impacts are proposed and any governing legislation, in this regard, must be strictly followed.

C1.02 Rainfall Data

The Town of Newmarket previously adopted the City of Scarborough Intensity/Duration/Frequency (IDF) curves for the 1:5 to 1:100 year storms only. The 1:100 year storm IDF was based on data taken from Pearson Airport and is still considered to be appropriate for Newmarket.

The more frequent IDF curves were based on Yarnell and have lower intensities than what is considered to be realistic for this area. The Town will continue to use the 1:5 year storm Yarnell IDF curve of $I=2464\ (T+16)^{-1.0}$ but only for the initial sizing of the storm sewer system. This will minimize conflicts in sewer design when new systems drain into older sewers and will provide a consistent level of convenience within the Town.

Rainfall IDF curves to be used are defined by the following equations:

1:2 year	$I = 648\ (T+4)^{-0.784}$ mm/hr
1:5 year	$I = 930\ (T+4)^{-0.798}$ mm/hr
1:10 year	$I = 1021\ (T+3)^{-0.787}$ mm/hr
1:25 year	$I = 1100\ (T+2)^{-0.776}$ mm/hr
1:50 year	$I = 1488\ (T+3)^{-0.803}$ mm/hr
1:100 year	$I = 1770\ (T+4)^{-0820}$ mm/hr

C1.03 Hydrology and Hydrologic Modelling

The estimation of peak design flow rates can be done using the Modified Rational Method or computer model simulation. The Modified Rational Method is typically used to design storm sewers and estimate peak flow rates from small urban areas. Its application should be limited to scenarios where the time of concentration (T_c) is less than approximately 30 minutes. The time of concentration (T_c) shall be determined as outlined in Section C4.03.

Computer analyses are best suited to large urban areas, rural areas and designing municipal SWM facilities.

The minimum and maximum duration of design storms are 4 hours and 24 hours respectively. Hyetographs of the design storms selected by the Town (distribution based on the Toronto-Pearson data and a 10 minute discretization) are provided in Appendix 3:

- 24 hour SCS (i.e. pond design)
- 4 hour Chicago distribution (i.e. HGL analyses)
- 24 hour Chicago distribution (where requested) (i.e. pond design).

The Town or LSRCA may request other design storm lengths and distributions for evaluation during the pre-consultation process.

C1.04 Levels of Service

The level of service to be provided by the storm drainage system is listed in Table C-1 unless stipulated otherwise. The planning of access routes for emergency services (i.e. police, fire, ambulance) may result in higher levels of service as determined by the Town.

Table C-1: Levels of Service for Major and Minor Systems

Item	Level of Service	Comments
Storm Sewers	1:5 year storm (Yarnell)	• catchbasin density such that sewers capacity largely used during 1:5 year storm
Hydraulic Gradeline	1:100 year storm	• no closer than 0.5 m between 1:100 year storm hydraulic gradeline and finished basement floor elevations
Major System	1:100 year storm	• large drainage areas may require classification as a floodplain using regulatory storm criteria (LSRCA) • overland flow cannot exceed width or flow capacity of right-of-way
Culverts	Per MTO Directive B-100	• refer to Table C-2
Stormwater Management	1:100 year storm	• unless otherwise directed by Town
Critical Infrastructure	Regional Storm or Greater	• very special cases to be specified at the discretion of the Town

Storm sewers are to be initially sized for the 1:5 year storm as per Table C-1. The Town of Newmarket Storm Sewer Design Sheet is included in Appendix 4. Subsequent hydraulic gradeline analyses and stormwater

1:2 Year 24 Hour SCS Design Storm

P_{total} – 52.12 mm

Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs	Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs
.20	.51	6.20	1.02	12.20	10.67	18.20	.76
.40	.51	6.40	1.02	12.40	6.60	18.40	.76
.60	.51	6.60	1.02	12.60	4.83	18.60	.76
.80	.51	6.80	1.02	12.80	4.57	18.80	.76
1.00	.51	7.00	1.02	13.00	3.30	19.00	.76
1.20	.51	7.20	1.02	13.20	2.79	19.20	.76
1.40	.51	7.40	1.02	13.40	2.79	19.40	.76
1.60	.51	7.60	1.02	13.60	2.79	19.60	.76
1.80	.51	7.80	1.02	13.80	2.79	19.80	.76
2.00	.51	8.00	1.02	14.00	2.79	20.00	.76
2.20	.51	8.20	1.52	14.20	1.52	20.20	.51
2.40	.51	8.40	1.52	14.40	1.52	20.40	.51
2.60	.51	8.60	1.52	14.60	1.52	20.60	.51
2.80	.51	8.80	1.52	14.80	1.52	20.80	.51
3.00	.51	9.00	1.52	15.00	1.52	21.00	.51
3.20	.51	9.20	1.52	15.20	1.52	21.20	.51
3.40	.51	9.40	1.52	15.40	1.52	21.40	.51
3.60	.51	9.60	1.52	15.60	1.52	21.60	.51
3.80	.51	9.80	1.52	15.80	1.52	21.80	.51
4.00	.51	10.00	1.52	16.00	1.52	22.00	.51
4.20	1.02	10.20	3.05	16.20	1.02	22.20	.51
4.40	1.02	10.40	3.05	16.40	1.02	22.40	.51
4.60	1.02	10.60	3.05	16.60	1.02	22.60	.51
4.80	1.02	10.80	3.05	16.80	1.02	22.80	.51
5.00	1.02	11.00	3.05	17.00	1.02	23.00	.51
5.20	1.02	11.20	4.06	17.20	1.02	23.20	.51
5.40	1.02	11.40	5.84	17.40	1.02	23.40	.51
5.60	1.02	11.60	13.21	17.60	1.02	23.60	.51
5.80	1.02	11.80	28.96	17.80	1.02	23.80	.51
6.00	1.02	12.00	60.45	18.00	1.02	24.00	.51

Use to compute stormwater detention volumes.

1:5 Year 24 Hour SCS Design Storm

P_{total} – 62.43 mm

Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs	Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs
.20	.76	6.20	1.27	12.20	12.19	18.20	1.27
.40	.76	6.40	1.27	12.40	7.62	18.40	1.27
.60	.76	6.60	1.27	12.60	5.59	18.60	1.27
.80	.76	6.80	1.27	12.80	5.08	18.80	1.27
1.00	.76	7.00	1.27	13.00	3.81	19.00	1.27
1.20	.76	7.20	1.27	13.20	3.05	19.20	1.02
1.40	.76	7.40	1.27	13.40	3.05	19.40	1.02
1.60	.76	7.60	1.27	13.60	3.05	19.60	1.02
1.80	.76	7.80	1.27	13.80	3.05	19.80	1.02
2.00	.76	8.00	1.27	14.00	3.05	20.00	1.02
2.20	.76	8.20	1.78	14.20	1.78	20.20	1.02
2.40	.76	8.40	1.78	14.40	1.78	20.40	1.02
2.60	.76	8.60	1.78	14.60	1.78	20.60	1.02
2.80	.76	8.80	1.78	14.80	1.78	20.80	1.02
3.00	.76	9.00	1.78	15.00	1.78	21.00	1.02
3.20	.76	9.20	1.78	15.20	1.78	21.20	.76
3.40	.76	9.40	1.78	15.40	1.78	21.40	.76
3.60	.76	9.60	1.78	15.60	1.78	21.60	.76
3.80	.76	9.80	1.78	15.80	1.78	21.80	.76
4.00	.76	10.00	1.78	16.00	1.78	22.00	.76
4.20	1.27	10.20	3.30	16.20	1.27	22.20	.76
4.40	1.27	10.40	3.30	16.40	1.27	22.40	.76
4.60	1.27	10.60	3.30	16.60	1.27	22.60	.76
4.80	1.27	10.80	3.30	16.80	1.27	22.80	.76
5.00	1.27	11.00	3.30	17.00	1.27	23.00	.76
5.20	1.27	11.20	4.57	17.20	1.27	23.20	.76
5.40	1.27	11.40	6.60	17.40	1.27	23.40	.76
5.60	1.27	11.60	15.24	17.60	1.27	23.60	.76
5.80	1.27	11.80	33.27	17.80	1.27	23.80	.76
6.00	1.27	12.00	69.60	18.00	1.27	24.00	.76

Use to compute stormwater detention volumes.

1:25 Year 24 Hour SCS Design Storm

P_{total} – 95.96 mm

Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs	Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs
.20	1.02	6.20	2.03	12.20	18.80	18.20	2.03
.40	1.02	6.40	2.03	12.40	11.68	18.40	2.03
.60	1.02	6.60	2.03	12.60	8.38	18.60	2.03
.80	1.02	6.80	2.03	12.80	8.13	18.80	2.03
1.00	1.02	7.00	2.03	13.00	5.59	19.00	2.03
1.20	1.02	7.20	2.03	13.20	4.83	19.20	1.52
1.40	1.02	7.40	2.03	13.40	4.83	19.40	1.52
1.60	1.02	7.60	2.03	13.60	4.83	19.60	1.52
1.80	1.02	7.80	2.03	13.80	4.83	19.80	1.52
2.00	1.02	8.00	2.03	14.00	4.83	20.00	1.52
2.20	1.02	8.20	2.79	14.20	2.79	20.20	1.52
2.40	1.02	8.40	2.79	14.40	2.79	20.40	1.52
2.60	1.02	8.60	2.79	14.60	2.79	20.60	1.52
2.80	1.02	8.80	2.79	14.80	2.79	20.80	1.52
3.00	1.02	9.00	2.79	15.00	2.79	21.00	1.52
3.20	1.02	9.20	2.79	15.20	2.79	21.20	1.02
3.40	1.02	9.40	2.79	15.40	2.79	21.40	1.02
3.60	1.02	9.60	2.79	15.60	2.79	21.60	1.02
3.80	1.02	9.80	2.79	15.80	2.79	21.80	1.02
4.00	1.02	10.00	2.79	16.00	2.79	22.00	1.02
4.20	2.03	10.20	5.08	16.20	2.03	22.20	1.02
4.40	2.03	10.40	5.08	16.40	2.03	22.40	1.02
4.60	2.03	10.60	5.08	16.60	2.03	22.60	1.02
4.80	2.03	10.80	5.08	16.80	2.03	22.80	1.02
5.00	2.03	11.00	5.08	17.00	2.03	23.00	1.02
5.20	2.03	11.20	7.11	17.20	2.03	23.20	1.02
5.40	2.03	11.40	10.41	17.40	2.03	23.40	1.02
5.60	2.03	11.60	23.37	17.60	2.03	23.60	1.02
5.80	2.03	11.80	51.56	17.80	2.03	23.80	1.02
6.00	2.03	12.00	107.44	18.00	2.03	24.00	1.02

Use to compute stormwater detention volumes.

1:100 Year 24 Hour SCS Design Storm

P_{total} – 112.42 mm

Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs	Time hrs	Rain mm/hr	Time hrs	Rain mm/hrs
.20	1.27	6.20	2.29	12.20	21.84	18.20	2.29
.40	1.27	6.40	2.29	12.40	13.72	18.40	2.29
.60	1.27	6.60	2.29	12.60	9.91	18.60	2.29
.80	1.27	6.80	2.29	12.80	9.40	18.80	2.29
1.00	1.27	7.00	2.29	13.00	6.60	19.00	2.29
1.20	1.27	7.20	2.29	13.20	5.59	19.20	1.78
1.40	1.27	7.40	2.29	13.40	5.59	19.40	1.78
1.60	1.27	7.60	2.29	13.60	5.59	19.60	1.78
1.80	1.27	7.80	2.29	13.80	5.59	19.80	1.78
2.00	1.27	8.00	2.29	14.00	5.59	20.00	1.78
2.20	1.27	8.20	3.30	14.20	3.30	20.20	1.78
2.40	1.27	8.40	3.30	14.40	3.30	20.40	1.78
2.60	1.27	8.60	3.30	14.60	3.30	20.60	1.78
2.80	1.27	8.80	3.30	14.80	3.30	20.80	1.78
3.00	1.27	9.00	3.30	15.00	3.30	21.00	1.78
3.20	1.27	9.20	3.30	15.20	3.30	21.20	1.27
3.40	1.27	9.40	3.30	15.40	3.30	21.40	1.27
3.60	1.27	9.60	3.30	15.60	3.30	21.60	1.27
3.80	1.27	9.80	3.30	15.80	3.30	21.80	1.27
4.00	1.27	10.00	3.30	16.00	3.30	22.00	1.27
4.20	2.29	10.20	6.10	16.20	2.29	22.20	1.27
4.40	2.29	10.40	6.10	16.40	2.29	22.40	1.27
4.60	2.29	10.60	6.10	16.60	2.29	22.60	1.27
4.80	2.29	10.80	6.10	16.80	2.29	22.80	1.27
5.00	2.29	11.00	6.10	17.00	2.29	23.00	1.27
5.20	2.29	11.20	8.13	17.20	2.29	23.20	1.27
5.40	2.29	11.40	11.94	17.40	2.29	23.40	1.27
5.60	2.29	11.60	27.43	17.60	2.29	23.60	1.27
5.80	2.29	11.80	59.94	17.80	2.29	23.80	1.27
6.00	2.29	12.00	126.49	18.00	2.29	24.00	1.27

Use to compute stormwater detention volumes.

when infiltration is likely to be diminished by saturated conditions. Percolation tests conducted between June 1 and December 31 should be done following a 24 hour pre-soaking period to simulate field saturated conditions. Pre-soaking is not required for permeameter or infiltrometer test methods.

To verify native soil infiltration rates for design purposes, it is strongly recommended that infiltration tests be carried out with a permeameter or infiltrometer to determine the field saturated hydraulic conductivity (K_{fs}), rather than percolation tests or grain-size analyses. Alternatively, other permeability test procedures that yield a saturated hydraulic conductivity rate can be used, such as formulas developed by Elrick and Reynolds, or others for computation of hydraulic conductivity and saturated hydraulic conductivity.

Many in-situ methods have been developed for determining field saturated hydraulic conductivity within the unsaturated (vadose) zone of the soil. Detailed testing methods and standards that are available but not discussed in detail in this protocol include (but are not limited to):

- Constant head well permeameter method (i.e., Guelph Permeameter method);
- Constant head double-ring infiltrometer method; and,
- Constant head pressure (single-ring) infiltrometer method.

A complete guide for comparing standard methods is presented in ASTM International Designation D5126-90 (2004). Further detailed discussion on standard methods can also be found in Amoozegar and Warrick (1986).

For the purpose of designing the infiltration BMP, hydraulic conductivity values (typically in centimetres per second) generated from permeameter or infiltrometer tests must be converted into infiltration rates (typically in millimetres per hour). **It is critical to note that hydraulic conductivity and infiltration rate are two different concepts and that conversion from one parameter to another cannot be done through unit conversion**. Particularly for fine grained soils, there is no consistent relationship due to the many factors involved. **Table C 2** and **Figure C 11** describe approximate relationships between hydraulic conductivity, percolation time and infiltration rate. Measured hydraulic conductivity values can be converted to infiltration rates using the approximate relationship described in **Figure C 11**.

Table C 2: Approximate relationships between hydraulic conductivity, percolation time and infiltration rate

Hydraulic Conductivity, K_{fs} (centimetres/second)	Percolation Time, T (minutes/centimetre)	Infiltration Rate, 1/T (millimetres/hour)
0.1	2	300
0.01	4	150
0.001	8	75
0.0001	12	50
0.00001	20	30
0.000001	50	12

***Source**: Ontario Ministry of Municipal Affairs and Housing (OMMAH). 1997. Supplementary Guidelines to the Ontario Building Code 1997. SG-6 Percolation Time and Soil Descriptions. Toronto, Ontario.*

APPENDIX K
Statement of Limiting Conditions and Assumptions

Statement of Limiting Conditions and Assumptions

1. This Report/Study (the "Work") has been prepared at the request of, and for the exclusive use of, the Owner, and its affiliates (the "Intended Users"). No one other than the Intended Users has the right to use and rely on the Work without first obtaining the written authorization of Cole Engineering Group Ltd. (Cole Engineering) and its Owner.

2. Cole Engineering expressly excludes liability to any party except the Intended Users for any use of, and/or reliance upon, the Work.

3. Cole Engineering notes that the following assumptions were made in completing the Work:

   a) the land use description(s) supplied to us are correct;
   b) the surveys and data supplied to Cole Engineering by the Owner are accurate;
   c) market timing, approval delivery and secondary source information is within the control of Parties other than Cole Engineering; and
   d) there are no encroachments, leases, covenants, binding agreements, restrictions, pledges, charges, liens or special assessments outstanding, or encumbrances which would significantly affect the use or servicing.

   Investigations have not been carried out to verify these assumptions. Cole Engineering deems the sources of data and statistical information contained herein to be reliable, but we extend no guarantee of accuracy in these respects.

4. Cole Engineering accepts no responsibility for legal interpretations, questions of survey, opinion of title, hidden or inconspicuous conditions of the property, toxic wastes or contaminated materials, soil or sub-soil conditions, environmental, engineering or other factual and technical matters disclosed by the Owner, the Client, or any public agency, which by their nature, may change the outcome of the Work. Such factors, beyond the scope of this Work, could affect the findings, conclusions and opinions rendered in the Work. We have made disclosure of related potential problems that have come to our attention. Responsibility for diligence with respect to all matters of fact reported herein rests with the Intended Users.

5. Cole Engineering practices engineering in the general areas of infrastructure and transportation. It is not qualified to and is not providing legal or planning advice in this Work.

6. The legal description of the property and the area of the site were based upon surveys and data supplied to us by the Owner. The plans, photographs, and sketches contained in this report are included solely to aide in visualizing the location of the property, the configuration and boundaries of the site, and the relative position of the improvements on the said lands.

7. We have made investigations from secondary sources as documented in the Work, but we have not checked for compliance with by-laws, codes, agency and governmental regulations, etc., unless specifically noted in the Work.

8. Because conditions, including capacity, allocation, economic, social, and political factors change rapidly and, on occasion, without notice or warning, the findings of the Work expressed herein, are as of the date of the Work and cannot necessarily be relied upon as of any other date without subsequent advice from Cole Engineering.

9. The value of proposed improvements should be applied only with regard to the purpose and function of the Work, as outlined in the body of this Work. Any cost estimates set out in the Work are based on construction averages and subject to change.

10. Neither possession of the Work, nor a copy of it, carries the right of publication. All copyright in the Work is reserved to Cole Engineering. The Work shall not be disclosed, produced or reproduced, quoted from, or referred to, in whole or in part, or published in any manner, without the express written consent of Cole Engineering and the Owner.

11. The Work is only valid if it bears the professional engineer's seal and original signature of the author, and if considered in its entirety. Responsibility for unauthorized alteration to the Work is denied.