

Functional Stormwater Management Report

1812 County Road 10, Ida, Ontario

Township of Cavan Monaghan, County of Peterborough

Engage Project Number 25017

Engage Engineering Ltd.

Issued for Draft Plan of Subdivision

January 26, 2026



Revision Summary

Revision No.	Revision Title	Date	Revision Summary
1	Issued for OPA, ZBA and Draft Plan of Subdivision	2026-01-26	Issued for review

Land Acknowledgement

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Executive Summary

Mr. Ian Cameron is proposing a 30-lot residential subdivision along County Road 10 in Ida, Ontario, just south of Cameron Court. This Functional Stormwater Management Report has been completed to support the planning applications for the development by summarizing existing and proposed hydrologic conditions, sizing stormwater systems for quantity and quality control, and identifying suitable low impact development (LID) measures.

Hydrologic modeling using Visual OTTHYMO software was completed to quantify the pre development and post development stormwater flows and determine the size of a stormwater management facility. The preliminary design of a wet pond was completed to ensure that the regulatory requirements for peak flow attenuation and water quality treatment can be met within the allocated block.

Lot level soakaway, low impact development features are proposed to promote infiltration, reduce runoff volumes and maintain the water balance of the site.

A conveyance system of culverts and swales will safely direct runoff into wet pond, reducing peak flows, improving water quality, and protecting downstream properties.

The recommendations within this report ensure compliance with local guidelines and support sustainable development. This report provides a framework for detailed design.

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1.0 Introduction

1.1 Purpose

Engage Engineering Limited (Engage) has been retained by Mr. Ian Cameron to prepare a Functional Stormwater Management Report in support of the proposed residential development located at 1812 County Road 10 in Ida, Ontario. The development will include 30 single family lots, new roads and supporting infrastructure.

The purpose of this report is to quantify the impact that the proposed development will have on stormwater runoff rates and to recommend any stormwater management measures required to maintain post-development to pre-development flows and reduce water quality impact on downstream receivers.

Recommendations made in this report are in accordance with Otonabee Region Conservation Authority (ORCA), Township of Cavan Monaghan, and Peterborough County requirements, in addition to current stormwater management best practices.

1.2 Site Description

The Subject Site is located in Ida, Ontario, approximately 100 m south of the intersection of County Road 10 and Cameron Court. The site is approximately 12.55 hectares and is currently used for agricultural fields with an existing house on the northern section of the property. There are forested hedgerows that divide the site into three agricultural fields.

North of the site is a rural subdivision development currently under construction. The site is bounded by County Road 10 to the east and undeveloped land to the west. There are three rural residences and the St. Johns Anglican Church south of the site.

The location of the subject site is identified on the Location Plan included as **Figure 1**.

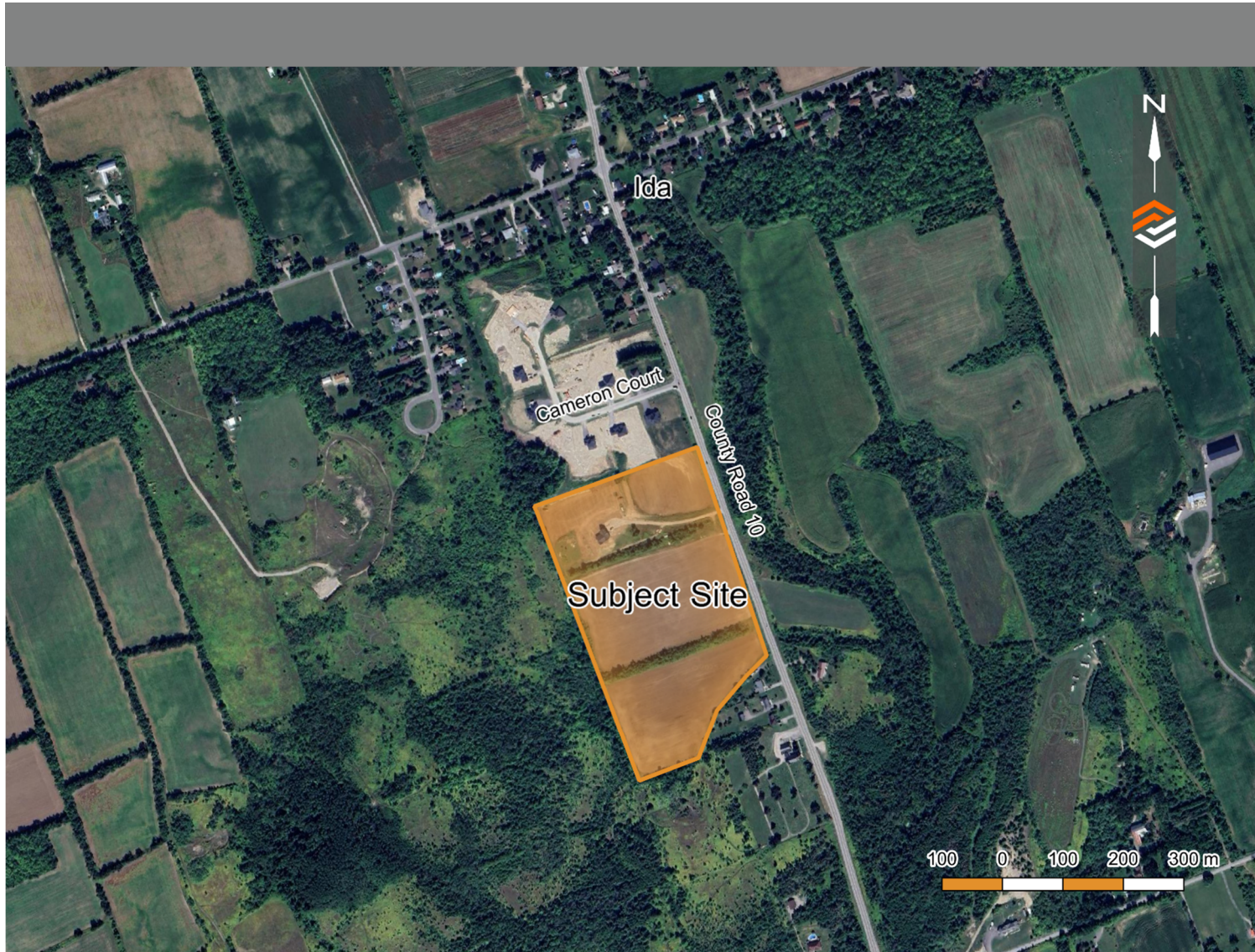


Figure 1: Location Plan



1.3 Background and Supporting Studies

A Geotechnical Investigation Report was prepared by Redstone Engineering Inc. dated June 13, 2025. The Investigation Report was completed to obtain information about the soils and groundwater conditions at test hole locations and summarize the conditions encountered. The sites subsurface conditions are described as a layer of topsoil, over shallow organic-bearing soils, over till with sand layers or sand seams. Eight monitoring wells were installed to observe groundwater levels throughout the site and preliminary infiltration rates were determined through In-situ percolation rate testing. The Geotechnical Investigation Report is included in **Appendix I**.

A Hydrogeological Report was prepared by Pigeonview Consulting Inc. dated January 8, 2026. The hydrogeological assessment includes a review of the hydrogeological conditions and subsurface conditions to determine if there are sufficient water resources to support private services for the subdivision.

Engage completed a topographic survey of the site on May 05, 2025. The survey was used to determine existing elevations, locations of existing features on the site, and to establish proposed grading and functional servicing design for the proposed development of the site.

North of the subject site is a development that is currently under construction. This development includes stormwater management features that should control peak stormwater flows to predevelopment levels. However, a stormwater management report for the development to the north was not available during the completion of this report.

1.4 References

The following guidelines, regulations and resources were referenced during the preparation of this stormwater management design and report:

- Ontario Ministry of Environment, Conservation, and Parks. (2003). Stormwater Management Planning and Design Manual.
- Sustainable Technologies Evaluation Program, Toronto and Region Conservation Authority (2019). Erosion and Sediment Control Guide for Urban Construction.
- Sustainable Technologies Evaluation Program. LID SWM Planning and Design Guide. Online Wiki accessed (October 2025)
- Standards & Contracts Branch, Highway Design Office, Ontario Ministry of Transportation, (2023, January). MTO Hydrotechnical Design Charts.
- Civica Infrastructure Inc. (2019, January) Visual OTTHYMO, Reference Guide. Version 6.0



- Conservation Authority Guidelines for Development Applications (2013, June). Hydrogeological Assessment Submissions.
- Ganaraska Region Conservation Authority (GRCA) (2014, December). Technical and Engineering Guidelines for Stormwater Management Submissions

These references provided the foundation for the design and implementation of the stormwater management strategies discussed in this report. Adhering to these established guidelines ensures that the practices used are not only effective, but also compliant with the necessary regulatory frameworks.

2.0 Hydrologic Analysis

2.1 Hydrologic Model

As part of this report, a hydrologic model representing the site under both existing and proposed conditions was developed using Visual OTTHYMO (VO) software. The model was used to simulate peak flows from the site under pre development and post development conditions for a variety of storm distributions and durations. This analysis was completed to verify stormwater management storage requirements and performance of the designed controls.

Rainfall data from the Meteorological Services of Canada Peterborough A station was used to develop the storm distributions in the model following typical recommendations from Otonabee Conservation. The rainfall data can be found in **Appendix A**.

The Geotechnical Investigation Report, aerial imagery and the topographic survey were used to determine the land use and soil types for the hydrologic model. According to the Geotechnical Investigation the soils are generally characterized as till with sand layers or sand seams. These soils have been classified as hydrologic Soils Group B for the purpose of this analysis. This classification aligns with the Hydrologic Soil Group mapping by the Ontario Ministry of Agriculture Food and Agribusiness, included in **Appendix A**.

Weighted Curve Numbers (CN) were established based on MTO Hydrotechnical Design Charts. These CN values were further converted into a CN* value using a total precipitation of 90 mm and initial abstraction of 5 mm.

Topographic information from the site survey, along with contour data from the County of Peterborough's online mapping, was used to delineate the existing and external catchment areas, and to determine the corresponding catchment lengths and times to peak.



2.2 Existing Conditions

The existing site is approximately 12.5 ha in size consisting primarily of crop land. There is a forested area in the centre of the site and treed hedge rows between the fields. There is an existing house on the northern portion of the site that has been recently constructed. This house and driveway have not been considered as an existing condition to be conservative. The site generally slopes towards a low point in the south and runoff generated within the site is directed into a culvert that crosses under County Road 10.

There are two existing catchment areas, and four external catchment area, that can be identified on the **Pre Development Catchment Area Plan** included as **Figure 3**. A description of the catchment areas can be found below.

- **EX1** (11.84 ha): This catchment is the northern portion of the site and is a mix of agricultural crop area and forested area. Runoff generated from this catchment flows southeast, towards the culvert under County Road 10. Runoff from this catchment will ultimately flow south into Cavan Creek.
- **EX2** (0.94 ha): This catchment is located in the south portion of the site and consists of agricultural crop areas and treed hedgerows. Runoff generated from this catchment sheet flows towards the southwest into the adjacent watercourse and eventually flows into Cavan Creek.
- **EXT3** (2.94 ha): This catchment is located northeast of the subject site and consists of the portion of County Road 10 and subdivision north of the site. Runoff generated from this catchment enters the roadside swale and eventually reaches the culvert under County Road 10. There are stormwater features in the subdivision north of the site that provide controls for some of the stormwater in this area. The quantity control features have not been included in this stormwater analysis to be conservative and it has been assumed that the post development peak flows match the predevelopment levels.
- **EXT4** (1.06 ha): This catchment is located along the northern boundary of the subject site, it consists of the rear yards of the subdivision north of the site. Runoff from this catchment areas enters the site across the north boundary and eventually reaches the culvert under County Road 10.
- **EXT5** (0.30 ha): This catchment is along the southeast boundary of the site and consists of a small area that directs excess runoff towards the site. Runoff generated from this catchment will eventually cross through the County Road 10 Culvert.



- **EXT6** (0.47 ha): This catchment is a small area south of the site. Runoff generated from this catchment will flow northwest through the site towards the southwest. This area generally consists of unimproved lands.

The existing characteristics of the catchment areas are summarized in **Table 1**. Area calculations and hydrologic characteristics are in **Appendix B**. Full VO model input parameters can be found in **Appendix C**.

Table 1 - Existing Catchment Area Characteristics

Catchment	Area (ha)	CN*	TP (hr)	VO Command
EX1	11.84	71	0.19	NASHYD
EX2	0.94	71	0.25	NASHYD
EXT3	2.94	59	0.11	STANDHYD
EXT4	1.06	59	0.11	STANDHYD
EXT5	0.30	61	0.16	NASHYD
EXT6	0.47	61	0.21	NASHYD

2.3 Proposed Conditions

Under the proposed conditions, the topography will change to accommodate the grading for the proposed buildings, roads and infrastructure. The proposed subdivision includes 30 residential lots, each greater than 3000 m² (3/4 acres). The proposed plan includes internal roads that connect County Road 10 and allow for a future expansion to the west. A stormwater block is located within the site's low point near the culvert under County Road 10. The proposed draft plan is included as **Figure 2** and the Preliminary Grading Plan is in **Appendix H**.

There are four proposed catchment areas and four external catchment areas identified on the Post Development Catchment Area Plan included as **Figure 4**. The external catchment areas, EXT3, EXT4, EXT5 and EXT6 are unchanged from the existing conditions. The respective internal catchment areas and their characteristics are summarized below.

- **PR1** (11.72 ha): This catchment area consists of low density rural residential lots, roads, sidewalks and the stormwater management block. Runoff generated from this catchment area will be collected in swales and directed into the proposed wet pond for controls. Controlled stormwater runoff will be directed east through the culvert under County Road 10 and eventually reach Cavan Creek.



- **PR2** (0.36 ha): Is located on the east side of the site, containing the site entrance off County Road 10. Runoff generated from this catchment area will sheet flow east towards EXT3 and the roadside swale along County Road 10. Runoff generated from this catchment will eventually cross through the culvert under County Road 10.
- **PR3** (0.70 ha): Is located on the southwest corner of the site, containing the rear portions of four residential lots. This area is composed of grassed lawns and impervious rooftops and driveways. Runoff generated from this catchment area is proposed to flow uncontrolled into the adjacent property similar to existing conditions. Due to grading constraints, it is not feasible to capture and control this area.

The hydrological characteristics of the proposed catchment areas were determined using the proposed site plan and grading plan. The road surface area was measured directly from the concept site plan and increased by 20% to account for potential additional impervious surfaces in the right of way. The residential area has been assigned a percent impervious of 23% and directly connected percent impervious of 15% following suggested values for ½ acre lots from GRCA guidelines. The key characteristics are summarized in **Table 2**. A complete list of the hydrologic parameters and area calculations can be found in **Appendix B**. VO model parameter inputs are included in **Appendix C**.

Table 2 - Proposed Catchment Area Characteristics

Catchment	Area (ha)	TIMP	XIMP	CN*	VO Command
PR1	11.72	0.28	0.21	59	STANDHYD
PR2	0.36	0.25	0.18	59	STANDHYD
PR3	0.70	0.23	0.15	59	STANDHYD

2.4 Existing and Proposed Peak Flows

Design storm events of various distributions and durations were simulated to capture a range of potential rainfall intensities and volumes, and to identify the controlling peak flow rates and maximum storage requirements. Shorter duration storms generally produce higher rainfall intensities, resulting in greater peak flows, while longer duration storms produce larger total rainfall volumes, which can govern storage requirements in stormwater management facilities. All storm events were derived using the



Peterborough A's rainfall stations data. A summary of the 100 year peak flows and storage required to attenuate the peak flows is in **Table 3**.

Table 3 – Design Storm Comparison

100 Year Design Storm	EX1 Peak Flow [m³/s]	PR1 Peak Flow [m³/s]	Maximum Storage Required* [m³]
Chicago 4hr	1.044	1.135	1462
Chicago 6hr	1.115	1.166	1490
Chicago 12hr	1.232	1.219	1537
SCS 6hr Type II	1.516	1.379	1696
SCS 12hr Type II	1.554	1.575	1706
SCS 24hr Type II	1.521	1.511	1704
AES 1hr 30%	0.874	1.106	1376
AES 12hr 30%	0.331	0.308	1232

*Maximum Storage Required based on the rating curve of a representative storage feature. This value is calculated early in the modeling to represent the approximate difference between design storms, not the actual storage requirements.

Based on the model results, the 12 hour storm was identified as the controlling event for pond storage. The 12 hour SCS Type II storm produced the highest peak flow for the existing and proposed conditions and required the highest storage volume. The 12 hour SCS Type II distribution and duration was selected as design storm for the site because it represents the critical condition for both peak flow and storage volume under the post development conditions and will result in appropriately sized infrastructure for the site.

Two sets of allowable release rates have been determined for the site based on existing peak flows of the corresponding catchment areas. The allowable release rates directed east, towards the culvert under County Road 10, are the peak flows from catchment areas EX1, EX4, and EXT5. The allowable release rate for the areas directed southwest are the peak flows from EX2 and EXT6. The proposed catchment areas directed towards the culvert under County Road 10 include PR1, PR2, EXT4, and EXT5. Excess stormwater runoff from EXT3 will also be directed through the culvert under County Road 10, but will not pass through the subject site. This catchment has been included in



the modelling to determine the total peak flows directed towards the culvert. The proposed catchment areas directed southwest is PR3 and EXT6.

Table 4 and **Table 5** summarize the allowable release rates and proposed uncontrolled release rates for the site.

Table 4 – Allowable and Proposed Uncontrolled Peak Flows East

Design Storm	Allowable Discharge Rate (EX1 + EXT4 + EXT5) [m ³ /s]	Proposed Uncontrolled Discharge Rate (PR1 + PR2 + EXT4 + EXT5) [m ³ /s]
2 Year	0.398	0.483
5 Year	0.684	0.721
10 Year	0.907	0.947
25 Year	1.206	1.197
50 Year	1.460	1.412
100 Year	1.693	1.730

The model results indicate that in the absence of any quantity controls, the peak flows discharging east from the site will increase when compared to the allowable release rates. Some form of quantity control is required for the catchment areas directed towards the east. Detailed model results are included in **Appendix D**.

Table 5 – Allowable and Proposed Uncontrolled Peak Flows Southwest

Design Storm	Allowable Discharge Rate (EX2 + EXT6) [m ³ /s]	Proposed Uncontrolled Discharge Rate (PR3 + EXT6) [m ³ /s]
2 Year	0.034	0.030
5 Year	0.059	0.050
10 Year	0.079	0.065
25 Year	0.105	0.091
50 Year	0.128	0.110
100 Year	0.149	0.128



The uncontrolled discharge rates under the proposed conditions are lower than the corresponding allowable release rates, as outlined in **Table 5**. Quantity control measures are not required for these catchments as the existing drainage patterns, and downstream capacity are expected to adequately convey the proposed uncontrolled flows without adverse impacts on adjacent properties.

3.0 Stormwater Management

A stormwater management strategy has been developed for the site to mitigate the potential impacts of the proposed development on the natural hydrologic cycle and neighbouring properties. The strategy includes a proposed wet pond, roadside swales, culverts and soakaway pits to provide the required quantity and quality control measures.

3.1 Quantity Control

The results of the hydrologic analysis indicate the peak flow rates directed towards the east will be greater than the allowable rates in absence of any quantity controls. A wet pond is proposed to provide control of post development runoff to allowable levels. VO model calculations were completed including the wet pond to determine the storage volumes and land area required to construct a pond that will attenuate the peak flows to allowable levels. The intent of the analysis at this stage is to ensure the feasibility of a wet pond within the provided stormwater block. The exact dimensions and details of the pond will be determined during the detailed design phase when additional details are available.

A functional wet pond surface was modeled within the pond block to determine a feasible stage storage relationship and size. The functional pond features the following:

- 5:1 side slopes for 3 m on either side of permanent pool
- Permanent pool depth of 1 m with 1414 m³ of storage at 255.70 m
- 729 m³ of extended detention volume with a drawdown time of 30.7 hours
- Active storage volume of 2704 m³
- 3 m maintenance path surrounding the pond
- Bottom of pond at 254.70 m, 0.09 m above the County Road 10 culvert invert

A rating curve has been developed for the pond using the stage storage and a two stage control structure. The control structure consists of a 100 mm orifice tube and 5.0 m rectangular weir. The orifice tube can be constructed as a reverse sloped pipe to allow colder water to discharge for the pond and control more frequent storm events. The orifice tube will extend the detention time of the pond beyond 24 hours. The weir will control the larger storm events up to and including the 100 year event. The weir can be constructed as a concrete structure along the side of the pond. The weir will act as



an emergency overflow in the event that the orifice tube becomes blocked or clogged. A forebay and inlet swale detailed will be included in the detailed design of the pond. The exact configuration of the outlet will be reevaluated during the detailed design stage of the project.

An abbreviated stage storage discharge (SSD) relationship for the wet pond is shown in **Table 6**. The complete stage storage discharge table is included in **Appendix C**.

Table 6 – Wet Pond Stage Storage Discharge

Stage [m]	Storage [m ³]	Storage [ha*m]	Discharge [m ³ /s]
255.70	0	0.000	0.000
256.00	616	0.062	0.014
256.10	844	0.084	0.112
256.20	1082	0.108	0.514
256.30	1332	0.133	1.086
256.40	1592	0.159	1.788
256.50	1859	0.186	2.598
256.60	2133	0.213	3.503
256.70	2415	0.242	4.495
256.80	2704	0.270	5.566

The rating curve was included in the route reservoir node to simulate the quantity controls provided by the outlet controls. **Table 7** summarizes the ponding elevations, discharge rate and storage required for the simulated design storms. The discharge and required storage were obtained from the detailed VO model results found in **Appendix D**.



Table 7 – Wet Pond Controlled Discharge

Description	Stage [m]	Discharge [m ³ /s]	Active Storage Required [m ³]
Permanent Pool	255.70	0.000	-
25 mm WQ Storm	256.03	0.015	682
2 Year	256.12	0.166	880
5 Year	256.19	0.387	1016
10 Year	256.23	0.628	1135
25 Year	256.27	0.892	1262
50 Year	256.31	1.097	1352
100 Year	256.36	1.392	1469
Top of Pond	256.80	5.566	-

The proposed wet pond has sufficient active storage volume to attenuate the 2 year through 100 year design storm flows to acceptable levels. **Table 8** demonstrates the overall discharge rates directed towards the east are at or below pre development release rates. The proposed discharge rates include uncontrolled flows from PR2 and controlled flows from PR1, EXT4, and EXT5. These results were extracted from the VO model results found in **Appendix D**.

Table 8 – Total Allowable and Proposed Release Rates East

Design Storm	Allowable Discharge Rate [m ³ /s]	Proposed Discharge Rate [m ³ /s]
2 Year	0.398	0.169
5 Year	0.684	0.397
10 Year	0.907	0.649
25 Year	1.206	0.910
50 Year	1.460	1.118
100 Year	1.693	1.416



3.2 Culvert Analysis

A culvert analysis was completed for the culvert under County Road 10 to ensure it has sufficient capacity to convey peak flows and determine if it will have any backflow impacts on the pond's outlets.

The culvert was modeled using the Hydraflow Express Extension for Autodesk Civil 3D software with a diameter of 1350 mm and assumed slope of 0.25%, and assumed length of 25 m. The culvert is modelled as a projecting circular corrugated metal pipe with a manning's roughness n value of 0.012. The results of the analysis are presented in **Table 9**.

Table 9 – Culvert Analysis Results

	Peak Flow	Upstream Depth of Flow	High Water Elevation	Velocity
Existing Conditions	2.203 m ³ /s	0.79 m	255.90 m	2.54 m/s
Proposed Conditions	1.877 m ³ /s	0.73 m	255.76 m	2.39 m/s

The results indicate the culvert under County Road 10 has sufficient capacity to convey the 100 year peak flows under both existing and proposed conditions. The depth of flow remains below the diameter of the culvert, and the high water elevation will not have back water impacts on the pond's outlets. The culverts flow type is inlet controlled therefore the assumed length and slope do not impact its capacity.

3.3 Quality Controls

Quality control is required for this site as the stormwater runoff from impervious surfaces will contain suspended solids and contaminants that can impact the receiving water course if released uncontrolled. Quality control for most of the site is provided by the permanent pool and extended detention within the wet pond.

No physical water quality controls are proposed for catchment areas PR2 and PR3. These catchments consist primarily of vegetated surfaces such as rear lots, and landscaped areas, with very limited impervious coverage. Dedicated water quality treatment measures are not warranted for these areas due to their relatively low potential for pollutant loading. In addition, the topography and site grading do not allow



these areas to be efficiently conveyed to the proposed wet pond. These catchments will rely on natural infiltration and overland flow through vegetated areas to provide passive water quality treatment.

The remainder of the site (PR1) will be controlled by the proposed wet pond. The total drainage area directed to the proposed wet pond is 13.59 ha, with an overall imperviousness of 27%. Based on the design criteria presented in Table 3.2 of the Stormwater Management Planning and Design Manual (2003), a water quality storage volume of 140 m³/ha is required for a contributing area with 27% impervious cover. The total water quality storage requirement therefore equals 1903 m³. This volume includes two components: the permanent pool and the extended detention volume. The extended detention volume is defined as the greater of 40 m³/ha or the volume necessary to retain the 25 mm design storm for more than 24 hours, while the remaining 100 m³/ha is provided as the permanent pool below the outlet invert.

The required permanent pool volume is 1359 m³. The functional pond has a total permanent pool volume of 1414 m³. This volume exceeds the required water quality volume. The proposed facility will therefore provide adequate water quality control for the site and is expected to achieve a long-term total suspended solids (TSS) removal efficiency greater than 80%. Detailed water quality calculations are included in **Appendix E**.

Drawdown calculations were completed using the preliminary wet pond to ensure it has sufficient volume to retain the 25 mm water quality storm for more than 24 hours. The proposed pond has a drawdown time of 30.7 hours. Full calculations are provided in **Appendix E**.

3.4 Low Impact Developments

Various low impact development features were considered during the development stage of the stormwater management strategy early in the design stage. Runoff from rooftop area of the individual lots will be directed into soakaway pits that will help maintain the water balance of the site and reduce runoff volumes.

Groundwater elevations throughout the site were measured as part of the geotechnical investigation. Seven boreholes were placed throughout the site. Three of the boreholes were installed with monitoring wells. Groundwater seepage was observed in six of the seven boreholes during the drilling process. The seepage depths ranged from 1.5 m to 5.2 m below ground level. Groundwater elevations readings were collected from the monitoring wells in May of 2025. The groundwater levels in the monitoring wells ranged from 0.5 m in BH4 to 2.15 m in BH6. Additional details can be found in the Geotechnical Investigation Report included in **Appendix H**.

Estimated percolation times from the geotechnical investigation range from 30-45 mins./cm across the site. The percolation time can be converted to an approximate



infiltration rate using Table C1 of Appendix C of the Low Impact Development Stormwater Management Planning and Design Guide (CVC & TRCA 2010). The resulting approximate infiltration rate is between 15 mm/hr and 24 mm/hr and an approximate design infiltration rate of 5 mm/hr to 8 mm/hr after applying a safety factor of 3.

Shallow soakaway pits are proposed to promote infiltration of rooftop runoff. The size and location of the proposed soakaway pits will be determined during the detailed design phase. Preliminary sizing calculations, included in **Appendix G**, suggest a maximum depth of 600 mm based on the design infiltration rates.

3.5 Stormwater Conveyance

Stormwater runoff generated from the majority of the site will be collected and conveyed into the proposed wet pond through vegetated grass swales and culverts along the proposed roads. The swales and culverts will be sized to safely convey the 100 year design flows into the pond. Conveyance calculations for typical swales that may be used in the detailed design have been completed and are found in **Appendix F**. The calculation results are summarized in **Table 10**.

Table 10 – Conveyance Swale Calculations

Typical Swale	Design Flow	Design Parameters	Full Channel Capacity	% Capacity	Velocity
Rear Yard Swale	1.56 m ³ /s, 100 Year PR1	Min Bed Slope: 1% Side Slope: 3:1 Bottom Width: 0.0 m Depth: 0.8 m Manning's n :	3.36 m ³ /s	46.5%	1.44 m/s
Roadside Swale	0.78 m ³ /s, 50% of 100 Year PR1	Bed Slope: 1.5% Side Slope: 3:1 Bottom Width: 0.0 m Depth: 0.5 m	1.17 m ³ /s	66.4%	1.41 m/s

There will be various culverts throughout the development that will convey stormwater runoff under the proposed driveways and roads towards the wet pond. Conveyance calculations will be completed during the detailed design stage to ensure they have sufficient capacity to safely convey the contributing runoff.



3.6 Water Balance

Water balance calculations should be completed at the detailed design stage to help size the low impact development features and ensure the natural hydrologic cycle of the site is maintained.

4.0 Operation and Maintenance

Proper operation and maintenance are critical to ensure the long term effectiveness of stormwater management facilities. The wet pond and other stormwater features will be designed to allow simple inspections and maintenance. A comprehensive inspection, operation, and maintenance plan will be prepared during the detailed design phase of the project.

5.0 Erosion and Sediment Control Plan

The development of the site, particularly the stripping of the site, will result in an area of exposed native soil, which in turn has the potential to erode and contribute sediment to downstream receivers. To mitigate these effects, an erosion and sediment control plan will be developed that incorporate best practices as outlined in the Erosion and Sediment Control Guidelines for Urban Construction, GGHCA.

The erosion and sediment control plan will include a phased approach to controls with boundary controls, interceptor swales, and a temporary sediment pond within the stormwater block. The full plan will be developed during the detailed design of the site.

6.0 Summary

The proposed residential development at 1812 County Road 10 in Ida, Ontario, will include 30 rural residential lots, various new roads, and supporting infrastructure. The proposed development will alter the site's hydrology by increasing impervious surfaces and changing drainage patterns. A stormwater management strategy has been developed to mitigate the negative impacts of the development on stormwater and provide the required controls.

The stormwater control strategy includes lot level soakaways, conveyance swales, culverts and a wet pond. The conveyance system is designed to safely collect stormwater runoff and direct it into the wet pond for water quality and quantity controls. The wet pond will ensure the post development peak flows are reduced to allowable levels and will provide a total suspended solids removal efficiency over 80%. The soakaways, vegetated swales and extended flow paths will promote infiltration and maintain water balance of the site.



The hydrologic modeling completed confirms the proposed controls are sufficiently sized to control runoff for all storm events up to the 100 year storm, protect downstream infrastructure, and minimize risk to adjacent properties.

Prepared by:

Reviewed by:



Logan Mattern, P. Eng.
Water Resources Engineer

Lucas Parsons, P. Eng.
Water Resources Group Manager

Figure 2: Draft Plan

**Figure 3: Pre Development
Catchment Area Plan**

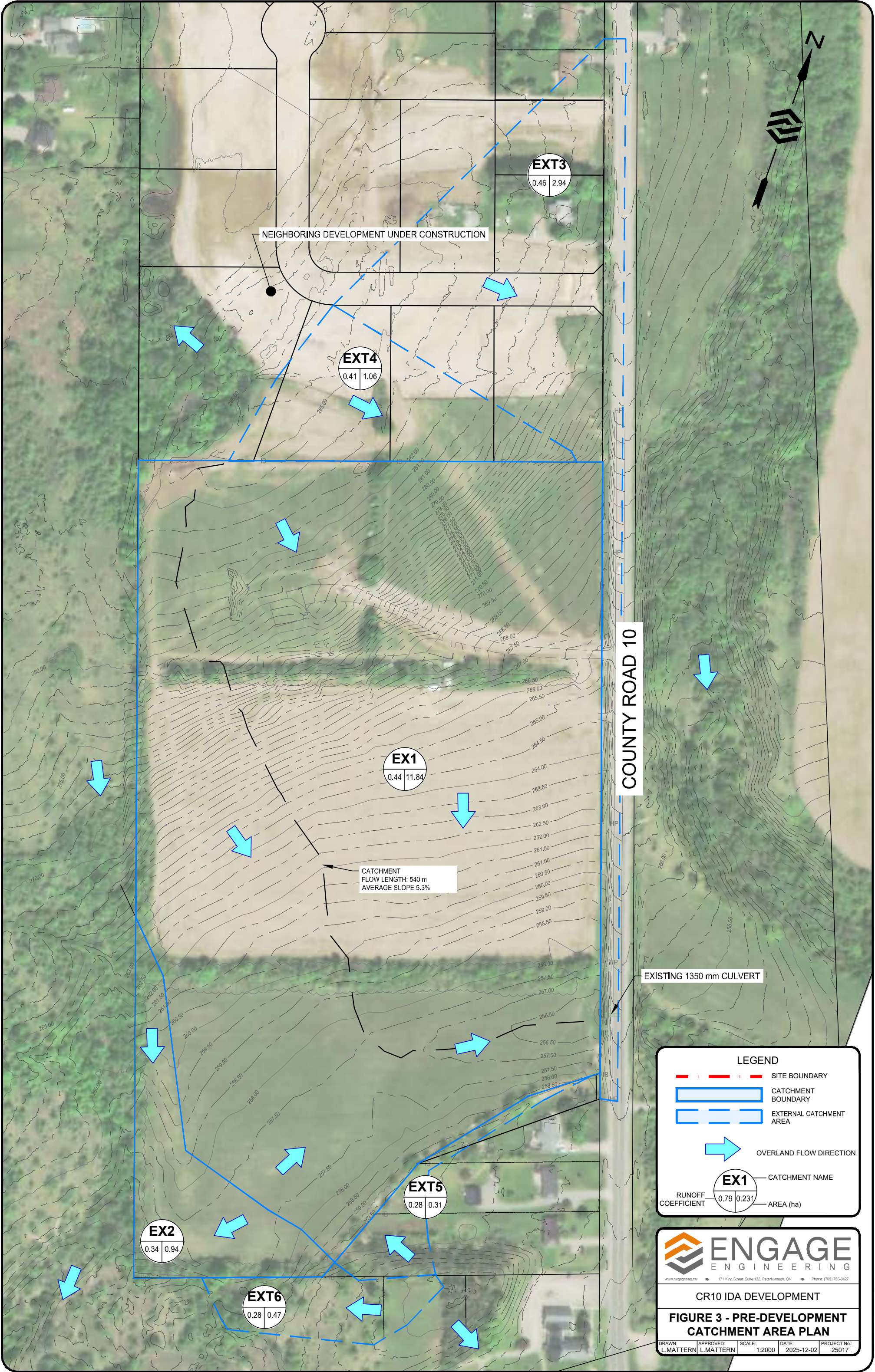
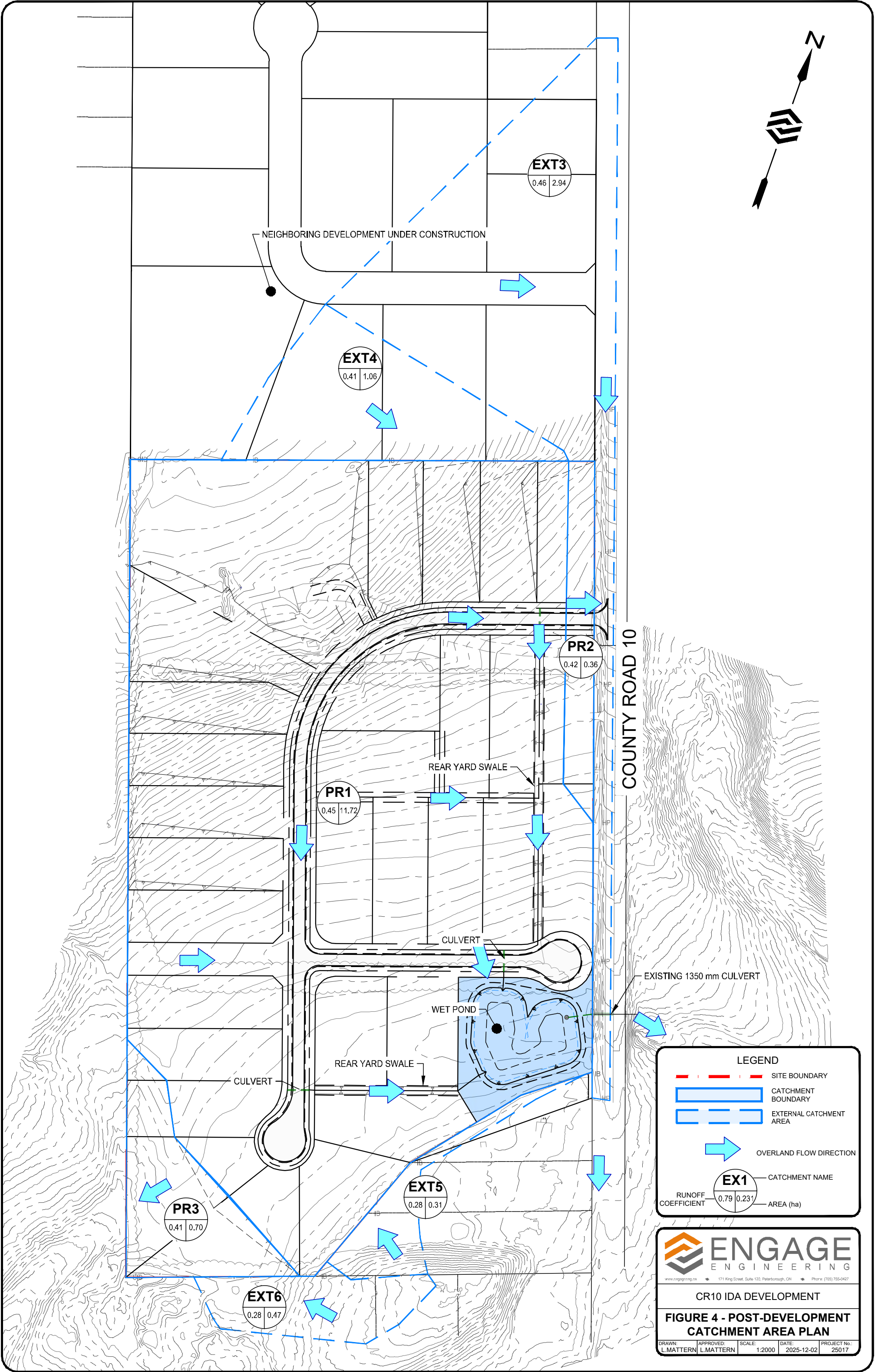
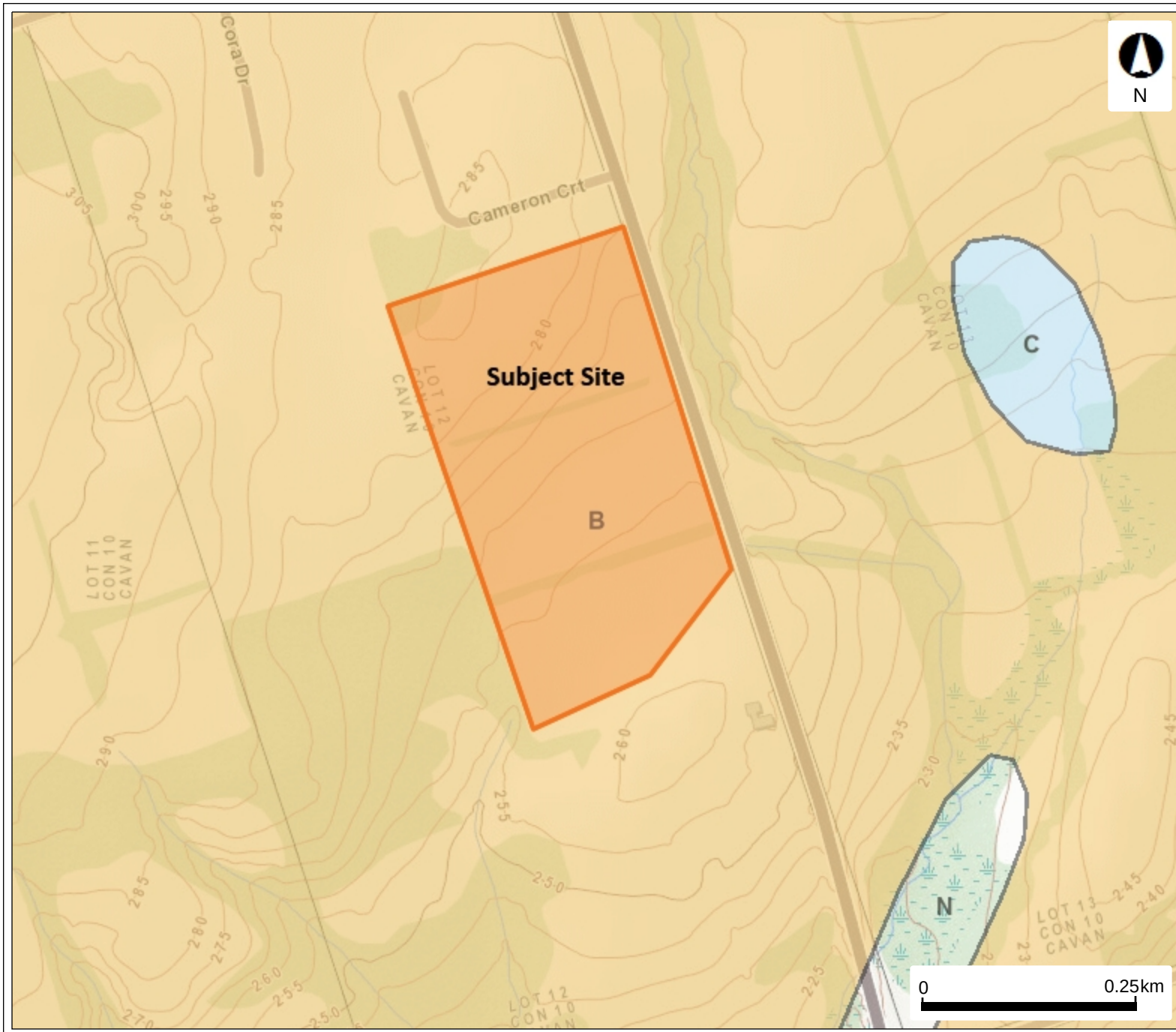


Figure 4: Post Development Catchment Area Plans



Appendix A: Background

Hydrologic Soil Group



Legend

Hydrologic Soil Group

- A - High
- B - Moderate
- C - Slow
- D - Very Slow

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Agriculture, Food and Agribusiness (OMAFRA) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Environment and Climate Change Canada
Environnement et Changement climatique Canada

Short Duration Rainfall Intensity-Duration-Frequency Data
Données sur l'intensité, la durée et la fréquence des chutes
de pluie de courte durée

Gumbel - Method of moments/Méthode des moments

2022/10/31

```
=====
PETERBOROUGH A                                ON            6166418
Latitude:  44 14'N    Longitude: 78 22'W    Elevation/Altitude: 191      m
Years/Années :  1971 - 2006          # Years/Années :      33
=====
```

```
*****
Table 1 : Annual Maximum (mm)/Maximum annuel (mm)
*****
```

Year Année	5 min	10 min	15 min	30 min	1 h	2 h	6 h	12 h	24 h
1971	4.3	5.8	7.4	11.7	17.5	24.6	30.7	34.8	34.8
1972	5.8	6.1	8.1	10.2	13.2	16.5	22.9	41.4	44.2
1973	6.9	13.2	18.0	19.3	20.8	26.7	48.0	48.3	58.2
1974	7.6	13.5	14.0	16.0	20.1	25.7	43.9	49.8	49.8
1975	6.3	9.9	13.7	21.8	39.6	55.1	55.1	67.8	67.8
1976	5.3	8.4	11.9	15.0	16.3	16.5	22.6	24.6	37.6
1977	8.4	12.7	13.7	19.6	24.9	24.9	52.3	62.2	62.5
1978	7.2	12.4	17.3	19.2	21.7	27.7	43.9	45.6	45.8
1979	10.1	13.8	15.3	17.5	26.2	31.6	33.3	33.7	33.7
1980	8.8	16.0	21.6	29.0	32.0	48.3	61.8	62.2	83.2
1981	9.7	18.6	27.9	42.3	52.2	53.2	53.4	53.4	54.1
1982	5.3	7.6	7.8	9.9	11.7	15.4	30.3	34.1	34.1
1983	11.3	18.3	23.3	25.1	26.1	36.3	56.8	57.1	77.5
1984	8.9	14.2	17.3	18.9	25.3	29.4	35.5	37.8	39.2
1985	7.6	10.4	12.0	19.7	22.7	26.8	36.4	53.6	53.6
1986	12.5	15.8	19.3	19.7	19.7	23.2	35.8	42.0	44.8
1987	17.9	21.3	22.7	23.2	23.2	23.2	23.2	26.0	29.0
1988	7.8	11.5	14.5	20.7	23.2	24.4	27.0	28.8	30.4
1989	9.9	14.2	15.7	18.7	20.2	26.3	46.1	47.8	52.8
1990	8.9	13.4	17.8	23.2	23.7	23.7	42.2	43.4	44.8
1991	4.1	6.8	7.6	8.8	9.2	12.2	17.1	21.2	29.6

1992	8.6	9.3	12.8	20.4	25.8	31.7	38.9	45.0	51.2
1993	9.1	10.9	14.1	20.4	21.9	23.3	29.9	34.2	42.0
1994	8.8	14.4	17.4	19.8	22.2	24.1	24.1	33.6	41.5
1995	9.3	12.1	18.1	32.2	49.0	82.5	89.8	90.1	90.1
1996	6.8	8.6	10.5	13.9	16.5	22.0	38.3	40.8	41.0
1997	3.6	7.2	7.6	9.2	17.8	30.6	35.0	35.2	35.2
1998	11.4	15.7	16.5	18.7	28.1	32.4	60.0	65.1	76.2
1999	8.4	11.4	13.5	18.6	23.2	32.5	39.9	46.8	55.6
2000	6.4	10.0	12.7	16.6	18.8	23.5	47.8	61.2	61.2
2002	7.3	9.6	10.4	13.8	23.4	35.1	50.9	73.6	73.6
2004	6.2	10.9	15.2	22.0	26.5	41.6	65.9	80.1	97.8
2006	7.4	11.1	12.5	14.2	15.0	17.8	22.0	34.0	42.5

# Yrs. Années	33	33	33	33	33	33	33	33	33
Mean Moyenne	8.1	12.0	14.8	19.1	23.6	30.0	41.2	47.1	52.0
Std. Dev. Écart-type	2.7	3.7	4.8	6.7	9.1	13.7	15.5	16.4	18.1
Skew. Dissymétrie	1.33	0.45	0.55	1.30	1.66	2.13	0.92	0.75	0.92
Kurtosis	7.16	3.29	3.67	6.74	6.80	9.09	4.68	3.45	3.35

*-99.9 Indicates Missing Data/Données manquantes

Warning: annual maximum amount greater than 100-yr return period amount

Avertissement : la quantité maximale annuelle excède la quantité
pour une période de retour de 100 ans

Year/Année	Duration/Durée	Data/Données	100-yr/ans
1981	30 min	42.3	40.1
1981	1 h	52.2	52.0
1987	5 min	17.9	16.7
1995	2 h	82.5	72.9

Table 2a : Return Period Rainfall Amounts (mm)
Quantité de pluie (mm) par période de retour

Duration/Durée	2	5	10	25	50	100	#Years Années
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	
5 min	7.7	10.1	11.7	13.7	15.2	16.7	33
10 min	11.4	14.6	16.8	19.5	21.5	23.5	33
15 min	14.0	18.3	21.1	24.7	27.4	30.0	33
30 min	18.0	23.9	27.8	32.8	36.4	40.1	33
1 h	22.1	30.1	35.4	42.1	47.1	52.0	33
2 h	27.7	39.8	47.8	57.9	65.4	72.9	33
6 h	38.7	52.4	61.5	72.9	81.4	89.9	33

12 h	44.4	58.9	68.5	80.6	89.5	98.4	33
24 h	49.0	65.0	75.6	88.9	98.9	108.7	33

Table 2b :

Return Period Rainfall Rates (mm/h) - 95% Confidence limits

Intensité de la pluie (mm/h) par période de retour - Limites de confiance de 95%

Duration/Durée	2	5	10	25	50	100	#Years
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	Années
5 min	92.0	121.0	140.2	164.4	182.3	200.2	33
	+/- 10.3	+/- 17.3	+/- 23.3	+/- 31.5	+/- 37.7	+/- 43.9	33
10 min	68.2	87.7	100.7	117.0	129.1	141.1	33
	+/- 6.9	+/- 11.7	+/- 15.7	+/- 21.2	+/- 25.4	+/- 29.6	33
15 min	56.0	73.1	84.5	98.8	109.4	120.0	33
	+/- 6.1	+/- 10.2	+/- 13.8	+/- 18.6	+/- 22.3	+/- 26.0	33
30 min	35.9	47.8	55.6	65.5	72.9	80.2	33
	+/- 4.2	+/- 7.1	+/- 9.6	+/- 12.9	+/- 15.4	+/- 18.0	33
1 h	22.1	30.1	35.4	42.1	47.1	52.0	33
	+/- 2.8	+/- 4.8	+/- 6.5	+/- 8.7	+/- 10.4	+/- 12.1	33
2 h	13.9	19.9	23.9	29.0	32.7	36.4	33
	+/- 2.1	+/- 3.6	+/- 4.9	+/- 6.6	+/- 7.9	+/- 9.2	33
6 h	6.4	8.7	10.2	12.2	13.6	15.0	33
	+/- 0.8	+/- 1.4	+/- 1.8	+/- 2.5	+/- 3.0	+/- 3.5	33
12 h	3.7	4.9	5.7	6.7	7.5	8.2	33
	+/- 0.4	+/- 0.7	+/- 1.0	+/- 1.3	+/- 1.6	+/- 1.8	33
24 h	2.0	2.7	3.1	3.7	4.1	4.5	33
	+/- 0.2	+/- 0.4	+/- 0.5	+/- 0.7	+/- 0.9	+/- 1.0	33

Table 3 : Interpolation Equation / Équation d'interpolation: $R = A \cdot T^B$

R = Interpolated Rainfall rate (mm/h)/Intensité interpolée de la pluie (mm/h)

RR = Rainfall rate (mm/h) / Intensité de la pluie (mm/h)

T = Rainfall duration (h) / Durée de la pluie (h)

Statistics/Statistiques	2	5	10	25	50	100
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans
Mean of RR/Moyenne de RR	33.4	44.0	51.0	59.9	66.5	73.1
Std. Dev. /Écart-type (RR)	32.1	41.8	48.1	56.2	62.2	68.1
Std. Error/Erreur-type	7.4	10.0	11.7	14.0	15.6	17.2
Coefficient (A)	20.5	27.4	31.9	37.7	41.9	46.1
Exponent/Exposant (B)	-0.680	-0.675	-0.672	-0.670	-0.669	-0.668

Mean % Error/% erreur moyenne	8.4	10.1	10.8	11.4	11.7	12.0
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Appendix B: Area and Hydrologic Calculations

VO₂ Hydrology Modeling Parameters Selection

COMMAND	PARAMETER	PARAMETER VALUE RECOMMENDATIONS		
STANDHYD when catchment area $T_{imp} > 20\%$	AREA	Digital delineation using software such as GIS or AutoCAD must be used to delineate subcatchment areas.		
	X_{imp}	Directly connected imperviousness shall be measured, if possible. Otherwise, use:		
		Land use	X_{IMP}^1 (Roof Leaders to Road)	X_{IMP}^2 (Roof Leaders to Lawn)
		Estate Residential (>3/4 Acre Lot)	0.14	0.09
		2 Acre Lot (180 ft wide)	0.11	0.08
		1½ Acre Lot (150 ft wide)	0.14	0.09
		1 Acre Lot (130 ft wide)	0.17	0.10
		Low Density Residential (1/3 to 3/4 Acre Lot)	0.23	0.15
		¾ Acre Lot (110 ft wide)	0.18	0.13
		½ Acre Lot (90 ft wide)	0.23	0.15
		1/3 Acre Lot (70 ft wide)	0.29	0.18
		Medium Density Residential (1/10 to 1/4 Acre Lot)	0.47	0.24
		¼ Acre Lot (60 ft wide)	0.35	0.20
		1/8 Acre Lot (50 ft wide)	0.52	0.25
		1/10 Acre Lot (40 ft wide)	0.55	0.28
		High Density Residential (<1/10 Acre Lot)	0.65	0.35
		Institutional (e.g. school, religious centre)	0.55	0.30
		Industrial	0.80	0.70
		Commercial/ Business	0.90	0.90
		Park	0.01	0.01
		1. Roof leaders connected to impervious area (e.g. driveway) and to storm sewer for X_{imp} calculations. 2. Roof leaders are connected to pervious area (e.g. lawn) for X_{imp} calculations, Public roads are included in all reported X_{imp} values.		

Designed By: LM

Date: 2026-01-12

Landuse Type	Impervious Area (m ²)	Grass Area (m ²)	Runoff Coeff	TIMP	XIMP	Total Area (m ²)
Road ROW	7254	8060	0.58	0.47	0.47	15314
Single Family Lots (Low Density)	22121	74059	0.41	0.23	0.15	96180
SWM Block	3789	1889	0.72	0.67	0.6	5678
Subtotal Impervious						33164
Subtotal Direct Impervious						25088
Subtotal Pervious						84008
Drainage Area Total						117172
% Impervious	28%					
% Directly Connected	21%					
Road surface area increased by 20% to account for driveways and sidewalks						

PERCENT IMPERVIOUS AREA CALCULATIONS PR2



Project Name: CR10 Ida Development

Designed By: LM

Project No: 25017

Date: 2026-01-12

Landuse Type	Impervious Area (m ²)	Grass Area (m ²)	Runoff Coeff	TIMP	XIMP	Total Area (m ²)
ROW	144	196	0.55	0.42	0.42	340
Single Family Lots (Low Density)	744	2492	0.41	0.23	0.15	3236
Subtotal Impervious						888
Subtotal Direct Impervious						628
Subtotal Pervious						2688
Drainage Area Total						3576
% Impervious	25%					
% Directly Connected	18%					

Date: 2026-01-12

Landuse Type	Impervious Area (m ²)	Grass Area (m ²)	Runoff Coeff	TIMP	XIMP	Total Area (m ²)
Single Family Lots (Low Density)	1620	5424	0.41	0.23	0.15	7044
Subtotal Impervious						1620.12
Subtotal Direct Impervious						1057
Subtotal Pervious						5423.88
Drainage Area Total						7044
% Impervious	23%					
% Directly Connected	15%					

Date: 2026-01-12

Landuse Type	Impervious Area (m ²)	Grass Area (m ²)	Runoff Coeff	TIMP	XIMP	Total Area (m ²)
Single Family Lots (Low Density)	4253	14239	0.41	0.23	0.15	18492
Roads	4477	0	0.95	1.00	1.00	4477
Roadside Grass	0	6383	0.25	0.00	0	6383
Subtotal Impervious						8730
Subtotal Direct Impervious						7251
Subtotal Pervious						20622
Drainage Area Total						29352
% Impervious	30%					
% Directly Connected	25%					

Designed By: LM

Date: 2026-01-12

Landuse Type	Impervious Area (m ²)	Grass Area (m ²)	Runoff Coeff	TIMP	XIMP	Total Area (m ²)
Single Family Lots (Low Density)	2440	8169	0.41	0.23	0.15	10609
Subtotal Impervious						2440
Subtotal Direct Impervious						1591
Subtotal Pervious						8169
Drainage Area Total						10609
% Impervious	23%					
% Directly Connected	15%					

Hydrologic Model and Catchment Summary



Project Name: CR 10 Ida Development
Project No: 25017

Designed By: LM
Date: 2026-01-12

Catchment Name		Land Use and Areas (ha)								Hydrologic Calculations										
Name	Description	CN = 86 Wetland	CN = 61 Grass	CN = 85 Gravel	CN = 74 Crop & Other Improved Land	CN = 65 Pasture & Other Unimproved Land	CN = 58 Woodlands and Forests	CN = 98 Impervious	Total	Hydrologic Calculations										
										CN Weighted	CN Weighted Pervious Areas	Percent Impervious	Directly Connected Impervious	Soils Group	Total Length (m)	Average Slope: Overall (%)	Time of Concentration (Minimum 10 Minutes)	Time to Peak (Hours)	Recession Period (k)	Composite Runoff Coefficient
EX1	North				10.670		1.165		11.835	72	72	0.0%	0%	B	540	5.3%	17.2	0.19	1.89	0.44
EX2	South				0.834		0.103		0.937	72	72	0.0%	0%	B	130	2.0%	22.5	0.25	2.33	0.34
EXT3	CR10 to Culvert		2.062					0.873	2.935	72	61	30%	25%	B	115	3.0%	10.0	0.11	2.18	0.46
EXT4	N Into EX1		0.817					0.244	1.061	70	61	23%	15%	B	50	3.0%	10.0	0.11	1.71	0.41
EXT5	S Into EX1					0.305			0.305	65	65	0%	0%	B	47	2.0%	14.6	0.16	1.78	0.28
EXT6	S Into EX2					0.467			0.467	65	65	0%	0%	B	107	3.0%	19.2	0.21	1.40	0.28
PR1	To SWM Pond		8.401					3.316	11.717	71	61	28%	21%	B	437	3.5%	15.2	0.17	2.67	0.45
PR2	To CR10		0.269					0.089	0.358	70	61	25%	18%	B	10	3.0%	10.0	0.11	1.32	0.42
PR3	South		0.542					0.162	0.704	70	61	23%	15%	B	11	3.0%	10.0	0.11	1.55	0.41

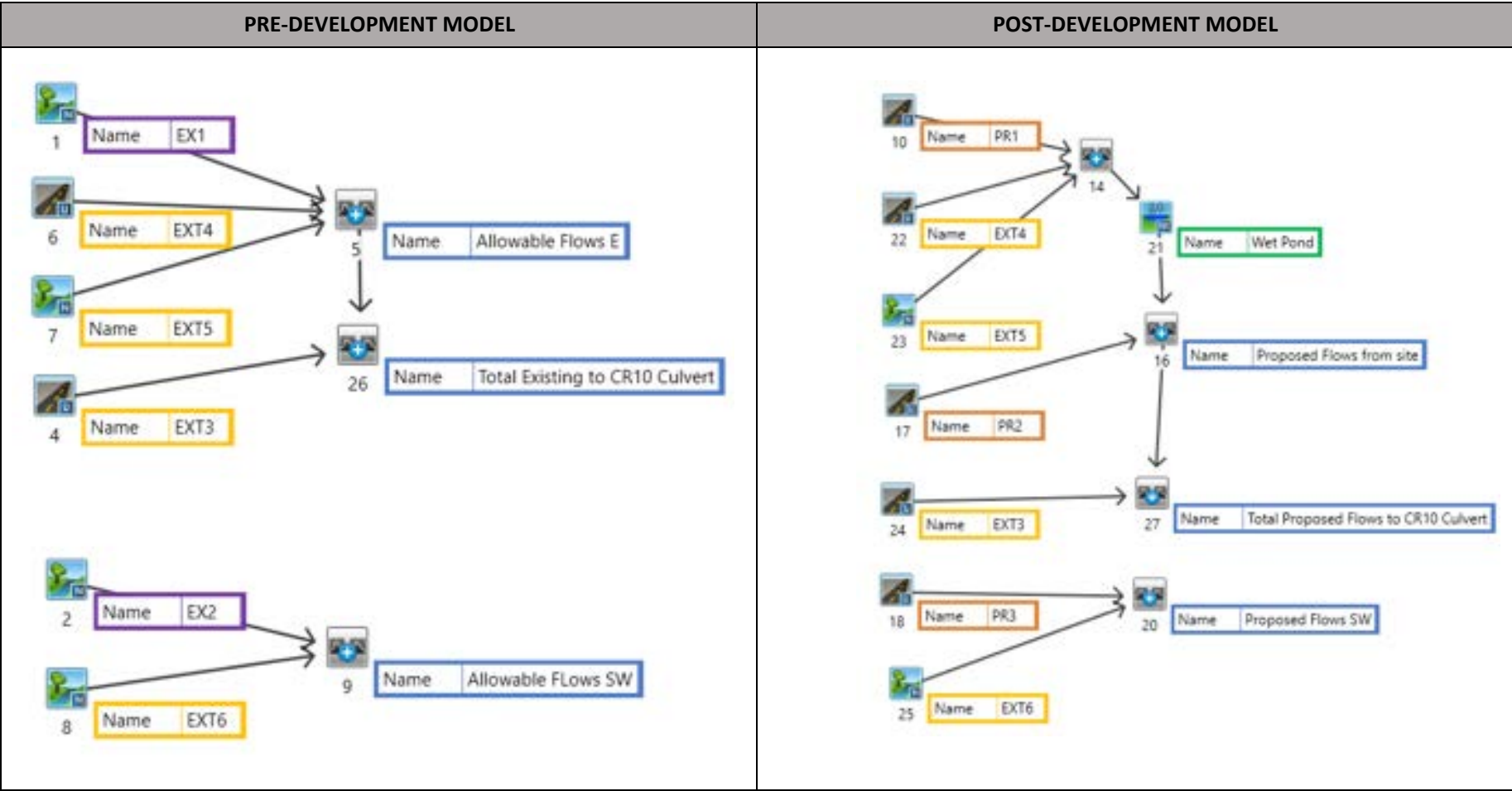
Appendix C: VO Inputs

Visual OTTHYMO Model



Project Name: CR 10 Ida Development
Project No: 25017

Designed By: LM
Date: 2026-01-12



Visual OTTHYMO Input Parameters

Project Name: CR 10 Ida Development Designed By: LM
Project No: 25017 Date: 2026-01-12

Parameter	Description	EX1	EX2	EXT3	EXT4	EXT5
COMMAND	STANDHYD or NASHYD	NASHYD	NASHYD	STANDHYD	STANDHYD	NASHYD
AREA	Catchment Area (ha)	11.835	0.937	2.935	1.061	0.305
DT	Time Step Increment (min)	5	5	5	5	5
TIMP	Total Impervious Area (%)	0.0%	0.0%	29.7%	23%	0%
XIMP	Directly Connected Impervious Area (%)			25.0%	15%	
DWF	Dry Weather Flow (m ³ /s)	0	0	0	0	0
CN	Pervious Weighted Curve Number	72	72	61	61	65
LOSS ¹	Modified CN*	71	71	59	59	61
IA	Initial Abstraction (Pervious)	5.0	5.0	5.0	5.0	5.0
TP	Unit Hydrograph Time to Peak (Hr)	0.19	0.25	0.11	0.11	0.16
K	Williams Recession Period (Hr)	1.89	2.33	2.18	1.71	1.78
SLPP	Average Slope Pervious Area (%)	5.3%	2.0%	2.0%	2.0%	2.0%
LGP	Overland Flow Length Pervious Area (m)	540	130	5	40	47
MNP	Manning's Roughness Coefficient (Pervious)	-	-	0.25	0.25	-
SCP	Storage Coefficient Pervious Area	-	-	0	0	-
DPSI	Depression Storage Impervious Area (mm/hr)	-	-	1	1	-
SLPI	Average Slope Impervious Area (%)			2.0%	2.0%	
LGI	Impervious Overland Flow Length $\sqrt{A/1.5} \times 100$ (m)	-	-	139.88	84.10	-
MNI	Manning's Roughness Coefficient (Impervious)	-	-	0.013	0.013	-
SCI	Storage Coefficient Impervious Area	-	-	0	0	-
RAIN	Optional Rainfall Intensity (mm/hr)	-	-	0	0	-

Notes:

1. CN values based on Design Chart 1.09 in MTO Drainage Manual
2. Modified CN derived from IA and CN using functionality in Visual OTTHYMO v6
3. Initial abstraction values derived from UNESCO Manual on Drainage in Urban Areas, 1987.
4. TC calculated using Airport Equation for $C < 0.4$ and Bransby Williams for $C > 0.4$.
5. Time to Peak estimated at $0.67T_c$.

Visual OTTHYMO Input Parameters

Project Name: CR 10 Ida Development

Designed By: LM

Project No: 25017

Date: 2026-01-12

Parameter	Description	EXT6
COMMAND	STANDHYD or NASHYD	NASHYD
AREA	Catchment Area (ha)	0.467
DT	Time Step Increment (min)	5
TIMP	Total Impervious Area (%)	0%
XIMP	Directly Connected Impervious Area (%)	
DWF	Dry Weather Flow (m ³ /s)	0
CN	Pervious Weighted Curve Number	65
LOSS ¹	Modified CN*	61
IA	Initial Abstraction (Pervious)	5.0
TP	Unit Hydrograph Time to Peak (Hr)	0.21
K	Williams Recession Period (Hr)	1.40
SLPP	Average Slope Pervious Area (%)	3.0%
LGP	Overland Flow Length Pervious Area (m)	107
MNP	Manning's Roughness Coefficient (Pervious)	-
SCP	Storage Coefficient Pervious Area	-
DPSI	Depression Storage Impervious Area (mm/hr)	-
SLPI	Average Slope Impervious Area (%)	
LGI	Impervious Overland Flow Length $\sqrt{A/1.5} \times 100$ (m)	-
MNI	Manning's Roughness Coefficient (Impervious)	-
SCI	Storage Coefficient Impervious Area	-
RAIN	Optional Rainfall Intensity (mm/hr)	-

Notes:

1. CN values based on Design Chart 1.09 in MTO Drainage Manual
2. Modified CN derived from IA and CN using functionality in Visual OTTHYMO v6
3. Initial abstraction values derived from UNESCO Manual on Drainage in Urban Areas, 198
4. TC calculated using Airport Equation for $C < 0.4$ and Bransby Williams for $C > 0.4$.
5. Time to Peak estimated at $0.67T_c$.

PR1	PR2	PR3
STANDHYD	STANDHYD	STANDHYD
11.717	0.358	0.704
5	5	5
28%	25%	23.0%
21%	18%	15.0%
0	0	0
61	61	61
59	59	59
5.0	5.0	5.0
0.17	0.11	0.11
2.67	1.32	1.55
5.0%	2.0%	2.0%
90	5	50
0.25	0.25	0.25
0	0	0
1	1	1
2.0%	2.0%	2.0%
279.49	48.85	68.51
0.013	0.013	0.013
0	0	0
0	0	0

Stage Storage Discharge Chart



Project Name: CR 10 Ida Development
Project Number: 25017

Designed By: LM
Date: 2026-01-21

Number of Stages (Max 5):

Outlet Configuration				Stage 1	Stage 2	Total	Notes
Stage Number:				Orifice Tube	Rectangular Weir		
Control Type:				0.100	5.000		
Orifice Diameter / Weir Width (m):				255.70	256.05		
Invert Elevations (m):				0.00	0.00		
Top of Catch Basin (m) / Included Angle (°):							
Discharge Table:	Elevation (m)	Active Storage (m³)	Total Storage (m³)	Controlled Discharge Rate (m³/s)			
	254.70	0		0.000	0.000	0.000	
	254.75	53		0.000	0.000	0.000	
	254.80	108		0.000	0.000	0.000	
	254.85	164		0.000	0.000	0.000	
	254.90	221		0.000	0.000	0.000	
	254.95	280		0.000	0.000	0.000	
	255.00	340		0.000	0.000	0.000	
	255.05	402		0.000	0.000	0.000	
	255.10	466		0.000	0.000	0.000	
	255.15	531		0.000	0.000	0.000	
	255.20	598		0.000	0.000	0.000	
	255.25	668		0.000	0.000	0.000	
	255.30	741		0.000	0.000	0.000	
	255.35	816		0.000	0.000	0.000	
	255.40	894		0.000	0.000	0.000	
	255.45	974		0.000	0.000	0.000	
	255.50	1057		0.000	0.000	0.000	
	255.55	1142		0.000	0.000	0.000	
	255.60	1230		0.000	0.000	0.000	
	255.65	1321		0.000	0.000	0.000	
Permanent Pool	255.70	0	1414	0.000	0.000	0.000	
	255.75	96	1510	0.002	0.000	0.002	
	255.80	195	1609	0.006	0.000	0.006	
	255.85	296	1710	0.009	0.000	0.009	
	255.90	400	1814	0.011	0.000	0.011	
	255.95	507	1921	0.012	0.000	0.012	
	256.00	616	2030	0.014	0.000	0.014	
25 mm	256.05	729	2143	0.015	0.000	0.015	Req. 682 m³ (256.03m)
	256.10	844	2258	0.016	0.095	0.112	
2 Year	256.15	962	2376	0.018	0.270	0.287	Req. 880 m³ (256.12m)
5 Year	256.20	1082	2496	0.019	0.495	0.514	Req. 1016 m³ (256.19m)
10 Year	256.25	1206	2620	0.020	0.762	0.782	Req. 1135 m³ (256.23m)
25 Year	256.30	1332	2746	0.021	1.066	1.086	Req. 1262 m³ (256.27m)
50 Year	256.35	1461	2875	0.022	1.401	1.422	Req. 1352 m³ (256.31m)
100 Year	256.40	1592	3006	0.022	1.765	1.788	Req. 1469 m³ (256.36m)
	256.45	1725	3139	0.023	2.157	2.180	
	256.50	1859	3273	0.024	2.573	2.598	
	256.55	1995	3409	0.025	3.014	3.039	
	256.60	2133	3547	0.026	3.477	3.503	
	256.65	2273	3687	0.026	3.962	3.988	
0.3m of Freeboard	256.70	2415	3829	0.027	4.467	4.495	
	256.75	2559	3973	0.028	4.993	5.021	
Top of Pond	256.80	2704	4118	0.029	5.537	5.566	

1. Orifice tube discharge calculated according to $Q=0.8A(2gh)^{1/2}$
2. Weir discharge calculated according to $Q=1.705LH^{1.5}$

Appendix D: VO Results

Pre Development Model Results

** SIMULATION:01 2yr 12hr 10min SCS Type II **

| READ STORM | Filename: C:\Users\lmattern\AppData
| | ata\Local\Temp\
| | a1f0d516-b69d-4367-b06a-562d46ba7241\68a7bb81
| Ptotal= 44.40 mm | Comments: 2yr 12hr 10min SCS Type II

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.17	1.69	6.33	7.60	9.50	1.43
0.17	0.96	3.33	1.69	6.50	5.68	9.67	1.37
0.33	0.98	3.50	1.69	6.67	4.35	9.83	1.31
0.50	0.99	3.67	1.77	6.83	3.91	10.00	1.25
0.67	1.01	3.83	1.90	7.00	3.47	10.17	1.20
0.83	1.03	4.00	2.04	7.17	3.09	10.33	1.18
1.00	1.05	4.17	2.23	7.33	2.85	10.50	1.16
1.17	1.07	4.33	2.43	7.50	2.61	10.67	1.14
1.33	1.08	4.50	2.63	7.67	2.39	10.83	1.12
1.50	1.10	4.67	2.94	7.83	2.22	11.00	1.09
1.67	1.12	4.83	3.27	8.00	2.05	11.17	1.07
1.83	1.14	5.00	3.61	8.17	1.92	11.33	1.05
2.00	1.15	5.17	4.26	8.33	1.86	11.50	1.03
2.17	1.21	5.33	5.07	8.50	1.80	11.67	1.00
2.33	1.29	5.50	5.88	8.67	1.73	11.83	0.98
2.50	1.38	5.67	17.59	8.83	1.68	12.00	0.96
2.67	1.47	5.83	43.70	9.00	1.62		
2.83	1.56	6.00	59.08	9.17	1.55		
3.00	1.64	6.17	9.53	9.33	1.49		

| CALIB |
| NASHYD (0002) | Area (ha)= 0.94 Curve Number (CN)= 71.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

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	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43

0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Unit Hyd Qpeak (cms)= 0.144
PEAK FLOW (cms)= 0.025 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 10.835
TOTAL RAINFALL (mm)= 44.400
RUNOFF COEFFICIENT = 0.244

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

| CALIB |
| NASHYD (0008) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.21

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	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 7.680

TOTAL RAINFALL (mm)= 44.400
RUNOFF COEFFICIENT = 0.173

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

ADD HYD (0009)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0002):	0.94	0.025	6.33	10.84
+ ID2= 2 (0008):	0.47	0.010	6.25	7.68
=====				
ID = 3 (0009):	1.41	0.034	6.25	9.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0001)				
ID= 1 DT= 5.0 min				

Area (ha)=	11.84	Curve Number (CN)=	71.0	
Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
U.H. Tp(hrs)=	0.19			

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	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12

1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Unit Hyd Qpeak (cms)= 2.380

PEAK FLOW (cms)= 0.372 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 10.819
TOTAL RAINFALL (mm)= 44.400
RUNOFF COEFFICIENT = 0.244

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

| CALIB
| NASHYD (0007) | Area (ha)= 0.31 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|-----
U.H. Tp(hrs)= 0.16

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	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31

0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 7.656
TOTAL RAINFALL (mm)= 44.400
RUNOFF COEFFICIENT = 0.172

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

| CALIB
| STANDHYD (0006) | Area (ha)= 1.06
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00
|-----

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	84.06	40.00

Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Max.Eff.Inten.(mm/hr)= 59.08 10.63
over (min) 5.00 20.00
Storage Coeff. (min)= 2.31 (ii) 19.61 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00

Unit Hyd. peak (cms)= 0.30 0.06
TOTALS
PEAK FLOW (cms)= 0.03 0.01 0.036 (iii)
TIME TO PEAK (hrs)= 6.17 6.42 6.17
RUNOFF VOLUME (mm)= 43.40 7.96 13.26
TOTAL RAINFALL (mm)= 44.40 44.40 44.40
RUNOFF COEFFICIENT = 0.98 0.18 0.30

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0005) |
1 + 2 = 3
ID1= 1 (0001): 11.84 0.372 6.25 10.82
+ ID2= 2 (0006): 1.06 0.036 6.17 13.26
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0005) |
3 + 2 = 1
ID1= 3 (0005): 12.90 0.391 6.25 11.02
+ ID2= 2 (0007): 0.31 0.007 6.17 7.66
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB
| STANDHYD (0004) | Area (ha)= 2.93
| ID= 1 DT= 5.0 min | Total Imp(%)= 30.00 Dir. Conn.(%)= 25.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.88 2.05

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 139.88 5.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 1.64 6.250 9.53 9.33 1.55
0.167 0.00 3.250 1.69 6.333 9.53 9.42 1.49
0.250 0.96 3.333 1.69 6.417 7.60 9.50 1.49
0.333 0.96 3.417 1.69 6.500 7.60 9.58 1.43
0.417 0.98 3.500 1.69 6.583 5.68 9.67 1.43
0.500 0.98 3.583 1.69 6.667 5.68 9.75 1.37
0.583 0.99 3.667 1.69 6.750 4.35 9.83 1.37
0.667 0.99 3.750 1.77 6.833 4.35 9.92 1.31
0.750 1.01 3.833 1.77 6.917 3.91 10.00 1.31
0.833 1.01 3.917 1.90 7.000 3.91 10.08 1.25
0.917 1.03 4.000 1.90 7.083 3.47 10.17 1.25
1.000 1.03 4.083 2.04 7.167 3.47 10.25 1.20
1.083 1.05 4.167 2.04 7.250 3.09 10.33 1.20
1.167 1.05 4.250 2.23 7.333 3.09 10.42 1.18
1.250 1.07 4.333 2.23 7.417 2.85 10.50 1.18
1.333 1.07 4.417 2.43 7.500 2.85 10.58 1.16
1.417 1.08 4.500 2.43 7.583 2.61 10.67 1.16
1.500 1.08 4.583 2.63 7.667 2.61 10.75 1.14
1.583 1.10 4.667 2.63 7.750 2.39 10.83 1.14
1.667 1.10 4.750 2.94 7.833 2.39 10.92 1.12
1.750 1.12 4.833 2.94 7.917 2.22 11.00 1.12
1.833 1.12 4.917 3.27 8.000 2.22 11.08 1.09
1.917 1.14 5.000 3.27 8.083 2.05 11.17 1.09
2.000 1.14 5.083 3.61 8.167 2.05 11.25 1.07
2.083 1.15 5.167 3.61 8.250 1.92 11.33 1.07
2.167 1.15 5.250 4.26 8.333 1.92 11.42 1.05
2.250 1.21 5.333 4.26 8.417 1.86 11.50 1.05
2.333 1.21 5.417 5.07 8.500 1.86 11.58 1.03
2.417 1.29 5.500 5.07 8.583 1.80 11.67 1.03
2.500 1.29 5.583 5.88 8.667 1.80 11.75 1.00
2.583 1.38 5.667 5.88 8.750 1.73 11.83 1.00
2.667 1.38 5.750 17.59 8.833 1.73 11.92 0.98
2.750 1.47 5.833 17.59 8.917 1.68 12.00 0.98
2.833 1.47 5.917 43.70 9.000 1.68 12.08 0.96
2.917 1.56 6.000 43.70 9.083 1.62 12.17 0.96
3.000 1.56 6.083 59.08 9.167 1.62
3.083 1.64 6.167 59.08 9.250 1.55
```

Max.Eff.Inten.(mm/hr)= 59.08 13.57

over (min) 5.00 10.00
Storage Coeff. (min)= 3.13 (ii) 6.91 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.27 0.14

TOTALS
PEAK FLOW (cms)= 0.12 0.06 0.177 (iii)
TIME TO PEAK (hrs)= 6.17 6.17 6.17
RUNOFF VOLUME (mm)= 43.40 7.72 16.64
TOTAL RAINFALL (mm)= 44.40 44.40 44.40
RUNOFF COEFFICIENT = 0.98 0.17 0.37

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----
| ADD HYD ( 0026) |
| 1 + 2 = 3 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 ( 0004): 2.93 0.177 6.17 16.64
+ ID2= 2 ( 0005): 13.20 0.398 6.25 10.94
=====
ID = 3 ( 0026): 16.14 0.562 6.17 11.98
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:02 5yr 12hr 10min SCS Type II **

```
-----
| READ STORM | Filename: C:\Users\lmattern\AppData
| | Local\Temp\
| | a1f0d516-b69d-4367-b06a-562d46ba7241\7675765d
| Ptotal= 58.80 mm | Comments: 5yr 12hr 10min SCS Type II
-----
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.17	2.24	6.33	10.07	9.50	1.90
0.17	1.27	3.33	2.24	6.50	7.52	9.67	1.81
0.33	1.29	3.50	2.24	6.67	5.76	9.83	1.73
0.50	1.32	3.67	2.34	6.83	5.17	10.00	1.65
0.67	1.34	3.83	2.52	7.00	4.59	10.17	1.59
0.83	1.36	4.00	2.70	7.17	4.09	10.33	1.56

1.00	1.39	4.17	2.95	7.33	3.78	10.50	1.54
1.17	1.41	4.33	3.22	7.50	3.46	10.67	1.50
1.33	1.43	4.50	3.48	7.67	3.16	10.83	1.48
1.50	1.46	4.67	3.89	7.83	2.94	11.00	1.45
1.67	1.48	4.83	4.33	8.00	2.71	11.17	1.42
1.83	1.50	5.00	4.78	8.17	2.54	11.33	1.39
2.00	1.53	5.17	5.64	8.33	2.47	11.50	1.36
2.17	1.60	5.33	6.71	8.50	2.39	11.67	1.33
2.33	1.71	5.50	7.79	8.67	2.30	11.83	1.30
2.50	1.82	5.67	23.29	8.83	2.22	12.00	1.27
2.67	1.95	5.83	57.87	9.00	2.14		
2.83	2.06	6.00	78.25	9.17	2.05		
3.00	2.17	6.17	12.62	9.33	1.98		

 | CALIB |
 | NASHYD (0002) | Area (ha)= 0.94 Curve Number (CN)= 71.0
 | ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

 U.H. Tp(hrs)= 0.25

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	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45

1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Unit Hyd Qpeak (cms)= 0.144

PEAK FLOW (cms)= 0.042 (i)
 TIME TO PEAK (hrs)= 6.250
 RUNOFF VOLUME (mm)= 18.357
 TOTAL RAINFALL (mm)= 58.800
 RUNOFF COEFFICIENT = 0.312

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

 | CALIB |
 | NASHYD (0008) | Area (ha)= 0.47 Curve Number (CN)= 61.0
 | ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

 U.H. Tp(hrs)= 0.21

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	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65

1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 13.366
TOTAL RAINFALL (mm)= 58.800
RUNOFF COEFFICIENT = 0.227

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

ADD HYD (0009)				
1	2	3	AREA (ha)	QPEAK (cms)
ID1= 1 (0002):	0.94	0.042	6.25	18.36
+ ID2= 2 (0008):	0.47	0.017	6.25	13.37
=====				
ID = 3 (0009):	1.41	0.059	6.25	16.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0001)	Area (ha)= 11.84	Curve Number (CN)= 71.0	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.19		

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	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Unit Hyd Qpeak (cms)= 2.380

PEAK FLOW (cms)= 0.638 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 18.329
TOTAL RAINFALL (mm)= 58.800
RUNOFF COEFFICIENT = 0.312

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

CALIB
NASHYD (0007) Area (ha)= 0.31 Curve Number (CN)= 61.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.16

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	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39

2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 13.327
TOTAL RAINFALL (mm)= 58.800
RUNOFF COEFFICIENT = 0.227

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

CALIB
STANDHYD (0006) Area (ha)= 1.06
ID= 1 DT= 5.0 min Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	84.06	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65

0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Max.Eff.Inten.(mm/hr)= 78.25 21.20
over (min) 5.00 20.00
Storage Coeff. (min)= 2.06 (ii) 15.19 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.31 0.07

TOTALS
PEAK FLOW (cms)= 0.03 0.03 0.055 (iii)
TIME TO PEAK (hrs)= 6.17 6.33 6.17
RUNOFF VOLUME (mm)= 57.80 13.75 20.35
TOTAL RAINFALL (mm)= 58.80 58.80 58.80
RUNOFF COEFFICIENT = 0.98 0.23 0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0005)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	11.84	0.638	6.25	18.33
+ ID2= 2 (0006):	1.06	0.055	6.17	20.35
=====				
ID = 3 (0005):	12.90	0.671	6.25	18.50
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.				

ADD HYD (0005)				
3 + 2 = 1				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0005):	12.90	0.671	6.25	18.50
+ ID2= 2 (0007):	0.31	0.013	6.17	13.33
=====				
ID = 1 (0005):	13.20	0.684	6.25	18.38
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.				

CALIB				
STANDHYD (0004)				
ID= 1 DT= 5.0 min				

	Area (ha)=	2.93		
	Total Imp(%)=	30.00	Dir. Conn.(%)=	25.00

	IMPERVIOUS		PERVIOUS (i)	
Surface Area	(ha)=	0.88	2.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	139.88	5.00	
Mannings n	=	0.013	0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81

0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Max.Eff.Inten.(mm/hr)= 78.25 23.51
over (min) 5.00 10.00
Storage Coeff. (min)= 2.80 (ii) 6.17 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.28 0.15

TOTALS
PEAK FLOW (cms)= 0.16 0.11 0.264 (iii)
TIME TO PEAK (hrs)= 6.17 6.17 6.17
RUNOFF VOLUME (mm)= 57.80 13.39 24.49
TOTAL RAINFALL (mm)= 58.80 58.80 58.80
RUNOFF COEFFICIENT = 0.98 0.23 0.42

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0026) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0004):  2.93  0.264  6.17  24.49
+ ID2= 2 ( 0005):  13.20  0.684  6.25  18.38
=====
      ID = 3 ( 0026):  16.14  0.925  6.17  19.49

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:03 10yr 12hr 10min SCS Type II **

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-----
| READ STORM |      Filename: C:\Users\lmattern\AppData
|             |      ata\Local\Temp\
|             |      a1f0d516-b69d-4367-b06a-562d46ba7241\85458f3
| Ptotal= 68.40 mm |      Comments: 10yr 12hr 10min SCS Type II
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TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.17	2.60	6.33	11.71	9.50	2.21
0.17	1.48	3.33	2.60	6.50	8.74	9.67	2.10
0.33	1.50	3.50	2.60	6.67	6.70	9.83	2.01
0.50	1.53	3.67	2.72	6.83	6.02	10.00	1.92
0.67	1.56	3.83	2.93	7.00	5.34	10.17	1.85
0.83	1.59	4.00	3.14	7.17	4.76	10.33	1.82
1.00	1.61	4.17	3.43	7.33	4.39	10.50	1.79
1.17	1.64	4.33	3.74	7.50	4.03	10.67	1.75
1.33	1.67	4.50	4.05	7.67	3.68	10.83	1.72
1.50	1.69	4.67	4.52	7.83	3.42	11.00	1.69
1.67	1.72	4.83	5.04	8.00	3.16	11.17	1.65
1.83	1.75	5.00	5.56	8.17	2.96	11.33	1.62
2.00	1.77	5.17	6.56	8.33	2.87	11.50	1.58
2.17	1.86	5.33	7.81	8.50	2.78	11.67	1.55
2.33	1.99	5.50	9.06	8.67	2.67	11.83	1.51
2.50	2.12	5.67	27.09	8.83	2.58	12.00	1.48
2.67	2.27	5.83	67.32	9.00	2.49		
2.83	2.40	6.00	91.02	9.17	2.39		
3.00	2.53	6.17	14.68	9.33	2.30		

| CALIB |

| NASHYD (0002) | Area (ha)= 0.94 Curve Number (CN)= 71.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 0.25

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	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Unit Hyd Qpeak (cms)= 0.144

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 24.028
TOTAL RAINFALL (mm)= 68.400
RUNOFF COEFFICIENT = 0.351

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

| CALIB |
| NASHYD (0008) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 0.21

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	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58

2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.023 (i)
 TIME TO PEAK (hrs)= 6.250
 RUNOFF VOLUME (mm)= 17.773
 TOTAL RAINFALL (mm)= 68.400
 RUNOFF COEFFICIENT = 0.260

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

ADD HYD (0009)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0002):	0.94	0.056	6.25	24.03
+ ID2= 2 (0008):	0.47	0.023	6.25	17.77
=====				
ID = 3 (0009):	1.41	0.079	6.25	21.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0001)			
ID= 1 DT= 5.0 min			

		Area (ha)=	11.84
		Curve Number (CN)=	71.0
		Ia (mm)=	5.00
		# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	0.19

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	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10

0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Unit Hyd Qpeak (cms)= 2.380

PEAK FLOW (cms)= 0.839 (i)
 TIME TO PEAK (hrs)= 6.250
 RUNOFF VOLUME (mm)= 23.992
 TOTAL RAINFALL (mm)= 68.400
 RUNOFF COEFFICIENT = 0.351

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

CALIB			
NASHYD (0007)			
ID= 1 DT= 5.0 min			

Area (ha)=	0.31	Curve Number (CN)=	61.0
Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
U.H. Tp(hrs)=	0.16		

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	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.017 (i)
 TIME TO PEAK (hrs)= 6.167
 RUNOFF VOLUME (mm)= 17.720
 TOTAL RAINFALL (mm)= 68.400
 RUNOFF COEFFICIENT = 0.259

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

 CALIB
 STANDHYD (0006)
 ID= 1 DT= 5.0 min
 Area (ha)= 1.06
 Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	84.06	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58

2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Max.Eff.Inten.(mm/hr)= 91.02 28.19
over (min) 5.00 15.00
Storage Coeff. (min)= 1.94 (ii) 13.65 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.31 0.08

TOTALS

PEAK FLOW (cms)= 0.04 0.04 0.075 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 67.40 18.23 25.60
TOTAL RAINFALL (mm)= 68.40 68.40 68.40
RUNOFF COEFFICIENT = 0.99 0.27 0.37

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0005)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	11.84	0.839	6.25	23.99
+ ID2= 2 (0006):	1.06	0.075	6.17	25.60
=====				
ID = 3 (0005):	12.90	0.890	6.25	24.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)				
3 + 2 = 1				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)

ID1= 3 (0005): 12.90 0.890 6.25 24.12
+ ID2= 2 (0007): 0.31 0.017 6.17 17.72
=====

ID = 1 (0005): 13.20 0.907 6.25 23.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0004)| Area (ha)= 2.93
| ID= 1 DT= 5.0 min | Total Imp(%)= 30.00 Dir. Conn.(%)= 25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65

2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Max.Eff.Inten.(mm/hr)= 91.02 31.20
over (min) 5.00 10.00
Storage Coeff. (min)= 2.64 (ii) 5.81 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.29 0.15

TOTALS

PEAK FLOW (cms)= 0.18 0.14 0.328 (iii)
TIME TO PEAK (hrs)= 6.17 6.17 6.17
RUNOFF VOLUME (mm)= 67.40 17.78 30.18
TOTAL RAINFALL (mm)= 68.40 68.40 68.40
RUNOFF COEFFICIENT = 0.99 0.26 0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0026)				
1 + 2 = 3				
ID1= 1 (0004):	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	2.93	0.328	6.17	30.18
+ ID2= 2 (0005):	13.20	0.907	6.25	23.98
=====				
ID = 3 (0026):	16.14	1.207	6.17	25.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:04 25yr 12hr 10min SCS Type II **

| READ STORM | Filename: C:\Users\lmattern\AppData
| | ata\Local\Temp\
| | a1f0d516-b69d-4367-b06a-562d46ba7241\110fe531
| Ptotal= 80.40 mm | Comments: 25yr 12hr 10min SCS Type II

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.17	3.06	6.33	13.77	9.50	2.59
0.17	1.74	3.33	3.06	6.50	10.28	9.67	2.47
0.33	1.77	3.50	3.06	6.67	7.87	9.83	2.37
0.50	1.80	3.67	3.20	6.83	7.07	10.00	2.26
0.67	1.83	3.83	3.44	7.00	6.28	10.17	2.18
0.83	1.86	4.00	3.69	7.17	5.59	10.33	2.14
1.00	1.89	4.17	4.03	7.33	5.16	10.50	2.10
1.17	1.93	4.33	4.40	7.50	4.73	10.67	2.06
1.33	1.96	4.50	4.76	7.67	4.32	10.83	2.02
1.50	1.99	4.67	5.32	7.83	4.02	11.00	1.98
1.67	2.02	4.83	5.93	8.00	3.71	11.17	1.94
1.83	2.06	5.00	6.54	8.17	3.48	11.33	1.90
2.00	2.09	5.17	7.71	8.33	3.37	11.50	1.86
2.17	2.19	5.33	9.18	8.50	3.26	11.67	1.82
2.33	2.34	5.50	10.65	8.67	3.14	11.83	1.78
2.50	2.50	5.67	31.85	8.83	3.03	12.00	1.74
2.67	2.67	5.83	79.13	9.00	2.93		
2.83	2.82	6.00	106.99	9.17	2.81		
3.00	2.97	6.17	17.25	9.33	2.70		

| CALIB |
| NASHYD (0002) | Area (ha)= 0.94 Curve Number (CN)= 71.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.25

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	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37

0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Unit Hyd Qpeak (cms)= 0.144

PEAK FLOW (cms)= 0.075 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 31.709
TOTAL RAINFALL (mm)= 80.400
RUNOFF COEFFICIENT = 0.394

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

CALIB	Area (ha)=	0.47	Curve Number (CN)=	61.0
NASHYD (0008)	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.21		

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	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.031 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 23.869
TOTAL RAINFALL (mm)= 80.400
RUNOFF COEFFICIENT = 0.297

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

| ADD HYD (0009) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	0.94	0.075	6.25	31.71
+ ID2= 2 (0008):	0.47	0.031	6.25	23.87
=====				
ID = 3 (0009):	1.41	0.105	6.25	29.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB
| NASHYD (0001) |
| ID= 1 DT= 5.0 min |

Area (ha)=	11.84	Curve Number (CN)=	71.0
Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
U.H. Tp(hrs)=	0.19		

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	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94

2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Unit Hyd Qpeak (cms)= 2.380

PEAK FLOW (cms)= 1.112 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 31.661
TOTAL RAINFALL (mm)= 80.400
RUNOFF COEFFICIENT = 0.394

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

| CALIB
| NASHYD (0007) |
| ID= 1 DT= 5.0 min |

Area (ha)=	0.31	Curve Number (CN)=	61.0
Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
U.H. Tp(hrs)=	0.16		

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	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18

1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.023 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 23.799
TOTAL RAINFALL (mm)= 80.400
RUNOFF COEFFICIENT = 0.296

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

CALIB			
STANDHYD (0006)	Area (ha)=	1.06	
ID= 1 DT= 5.0 min	Total Imp(%)=	23.00	Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	84.06	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Max.Eff.Inten.(mm/hr)=	106.99	44.09
over (min)	5.00	15.00
Storage Coeff. (min)=	1.82 (ii)	11.61 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.32	0.09

TOTALS

PEAK FLOW (cms)=	0.05	0.06	0.099 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.17

RUNOFF VOLUME (mm)= 79.40 24.42 32.66
TOTAL RAINFALL (mm)= 80.40 80.40 80.40
RUNOFF COEFFICIENT = 0.99 0.30 0.41

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0005)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	11.84	1.112	6.25	31.66
+ ID2= 2 (0006):	1.06	0.099	6.17	32.66
=====				
ID = 3 (0005):	12.90	1.183	6.25	31.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0005):	12.90	1.183	6.25	31.74
+ ID2= 2 (0007):	0.31	0.023	6.17	23.80
=====				
ID = 1 (0005):	13.20	1.206	6.25	31.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	2.93
STANDHYD (0004)	Total Imp(%)=	30.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Max.Eff.Inten.(mm/hr)=	106.99	41.82
over (min)	5.00	10.00
Storage Coeff. (min)=	2.47 (ii)	5.45 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.29	0.16

PEAK FLOW (cms)= 0.22 0.20 0.413 (iii)
TIME TO PEAK (hrs)= 6.17 6.17 6.17
RUNOFF VOLUME (mm)= 79.40 23.85 37.74
TOTAL RAINFALL (mm)= 80.40 80.40 80.40
RUNOFF COEFFICIENT = 0.99 0.30 0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0026)
1 + 2 = 3
ID1= 1 (0004): 2.93 0.413 6.17 37.74
+ ID2= 2 (0005): 13.20 1.206 6.25 31.56
ID = 3 (0026): 16.14 1.585 6.17 32.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:05 50yr 12hr 10min SCS Type II **

READ STORM
Ptotal= 90.00 mm
Filename: C:\Users\lmattern\AppData\Local\Temp\ a1f0d516-b69d-4367-b06a-562d46ba7241\5983fc7d
Comments: 50yr 12hr 10min SCS Type II

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.17	3.42	6.33	15.41	9.50	2.90
0.17	1.95	3.33	3.42	6.50	11.51	9.67	2.77
0.33	1.98	3.50	3.42	6.67	8.81	9.83	2.65
0.50	2.01	3.67	3.58	6.83	7.92	10.00	2.53
0.67	2.05	3.83	3.85	7.00	7.03	10.17	2.44
0.83	2.09	4.00	4.13	7.17	6.26	10.33	2.40
1.00	2.12	4.17	4.51	7.33	5.78	10.50	2.35
1.17	2.16	4.33	4.92	7.50	5.30	10.67	2.30
1.33	2.19	4.50	5.33	7.67	4.84	10.83	2.26
1.50	2.23	4.67	5.95	7.83	4.49	11.00	2.22

1.67	2.27	4.83	6.63	8.00	4.15	11.17	2.17
1.83	2.30	5.00	7.32	8.17	3.89	11.33	2.13
2.00	2.34	5.17	8.63	8.33	3.77	11.50	2.08
2.17	2.45	5.33	10.27	8.50	3.65	11.67	2.04
2.33	2.62	5.50	11.92	8.67	3.52	11.83	1.99
2.50	2.79	5.67	35.65	8.83	3.40	12.00	1.95
2.67	2.99	5.83	88.58	9.00	3.28		
2.83	3.16	6.00	119.76	9.17	3.14		
3.00	3.33	6.17	19.31	9.33	3.02		

CALIB
NASHYD (0002)
ID= 1 DT= 5.0 min
Area (ha)= 0.94 Curve Number (CN)= 71.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

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	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13

2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Unit Hyd Qpeak (cms)= 0.144

PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 38.248
TOTAL RAINFALL (mm)= 90.000
RUNOFF COEFFICIENT = 0.425

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

CALIB			
NASHYD (0008)	Area (ha)=	0.47	Curve Number (CN)= 61.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.21	

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	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40

1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.038 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 29.157
TOTAL RAINFALL (mm)= 90.000
RUNOFF COEFFICIENT = 0.324

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

ADD HYD (0009)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0002):	0.94	0.090	6.25	38.25
+ ID2= 2 (0008):	0.47	0.038	6.25	29.16
=====				
ID = 3 (0009):	1.41	0.128	6.25	35.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0001)	Area (ha)=	11.84	Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00

----- U.H. Tp(hrs)= 0.19

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	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Unit Hyd Qpeak (cms)= 2.380

PEAK FLOW (cms)= 1.345 (i)
TIME TO PEAK (hrs)= 6.250

RUNOFF VOLUME (mm)= 38.190
TOTAL RAINFALL (mm)= 90.000
RUNOFF COEFFICIENT = 0.424

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

| CALIB |
| NASHYD (0007) | Area (ha)= 0.31 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.16

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	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04

2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.028 (i)
 TIME TO PEAK (hrs)= 6.167
 RUNOFF VOLUME (mm)= 29.072
 TOTAL RAINFALL (mm)= 90.000
 RUNOFF COEFFICIENT = 0.323

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

 CALIB
 STANDHYD (0006)
 ID= 1 DT= 5.0 min
 Area (ha)= 1.06
 Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	84.06	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39

1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Max.Eff.Inten.(mm/hr)= 119.76 53.73
 over (min) 5.00 15.00
 Storage Coeff. (min)= 1.74 (ii) 10.79 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.32 0.09

TOTALS

PEAK FLOW (cms)= 0.05 0.08 0.118 (iii)
 TIME TO PEAK (hrs)= 6.17 6.25 6.17
 RUNOFF VOLUME (mm)= 89.00 29.77 38.65
 TOTAL RAINFALL (mm)= 90.00 90.00 90.00
 RUNOFF COEFFICIENT = 0.99 0.33 0.43

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | ADD HYD (0005)|

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	11.84	1.345	6.25	38.19
+ ID2= 2 (0006):	1.06	0.118	6.17	38.65
=====				
ID = 3 (0005):	12.90	1.433	6.25	38.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1				
ID1= 3 (0005):	12.90	1.433	6.25	38.23
+ ID2= 2 (0007):	0.31	0.028	6.17	29.07
=====				
ID = 1 (0005):	13.20	1.460	6.25	38.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	2.93
STANDHYD (0004)	Total Imp(%)=	30.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53

1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Max.Eff.Inten.(mm/hr)=	119.76	51.01
over (min)	5.00	10.00
Storage Coeff. (min)=	2.36 (ii)	5.21 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.30	0.16

TOTALS

PEAK FLOW (cms)=	0.24	0.24	0.486 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	89.00	29.12	44.09
TOTAL RAINFALL (mm)=	90.00	90.00	90.00
RUNOFF COEFFICIENT =	0.99	0.32	0.49

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0026) |
1 + 2 = 3
ID1= 1 (0004): AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
2.93 0.486 6.17 44.09
+ ID2= 2 (0005): 13.20 1.460 6.25 38.02
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:06 100yr 12hr 10min SCS Type II **

| READ STORM | Filename: C:\Users\lmattern\AppData
| | ata\Local\Temp\
| | a1f0d516-b69d-4367-b06a-562d46ba7241\8f30ea0c
| Ptotal= 98.40 mm | Comments: 100yr 12hr 10min SCS Type II

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.17	3.74	6.33	16.85	9.50	3.18
0.17	2.13	3.33	3.74	6.50	12.58	9.67	3.03
0.33	2.16	3.50	3.74	6.67	9.63	9.83	2.89
0.50	2.20	3.67	3.91	6.83	8.66	10.00	2.76
0.67	2.24	3.83	4.21	7.00	7.68	10.17	2.67
0.83	2.28	4.00	4.51	7.17	6.84	10.33	2.62
1.00	2.32	4.17	4.93	7.33	6.32	10.50	2.57
1.17	2.36	4.33	5.38	7.50	5.79	10.67	2.52
1.33	2.40	4.50	5.83	7.67	5.29	10.83	2.47
1.50	2.44	4.67	6.51	7.83	4.91	11.00	2.42
1.67	2.48	4.83	7.25	8.00	4.54	11.17	2.37
1.83	2.52	5.00	8.00	8.17	4.26	11.33	2.33
2.00	2.55	5.17	9.44	8.33	4.13	11.50	2.28
2.17	2.68	5.33	11.23	8.50	3.99	11.67	2.23
2.33	2.87	5.50	13.03	8.67	3.84	11.83	2.18
2.50	3.05	5.67	38.98	8.83	3.71	12.00	2.13
2.67	3.26	5.83	96.85	9.00	3.58		
2.83	3.45	6.00	130.94	9.17	3.44		
3.00	3.64	6.17	21.12	9.33	3.31		

| CALIB |
| NASHYD (0002) | Area (ha)= 0.94 Curve Number (CN)= 71.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.25

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	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Unit Hyd Qpeak (cms)= 0.144

PEAK FLOW (cms)= 0.105 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 44.213
TOTAL RAINFALL (mm)= 98.400

RUNOFF COEFFICIENT = 0.449

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

CALIB
NASHYD (0008) Area (ha)= 0.47 Curve Number (CN)= 61.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.21

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	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18

2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.044 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 34.049
TOTAL RAINFALL (mm)= 98.400
RUNOFF COEFFICIENT = 0.346

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

ADD HYD (0009)
1 + 2 = 3
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0002): 0.94 0.105 6.25 44.21
+ ID2= 2 (0008): 0.47 0.044 6.25 34.05
===== ID = 3 (0009): 1.41 0.149 6.25 40.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0001) Area (ha)= 11.84 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

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	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76

0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Unit Hyd Qpeak (cms)= 2.380

PEAK FLOW (cms)= 1.557 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 44.146
TOTAL RAINFALL (mm)= 98.400
RUNOFF COEFFICIENT = 0.449

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

CALIB			
NASHYD (0007)	Area (ha)=	0.31	Curve Number (CN)= 61.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.16	

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	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 33.949
TOTAL RAINFALL (mm)= 98.400
RUNOFF COEFFICIENT = 0.345

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

| CALIB
| STANDHYD (0006)
ID= 1 DT= 5.0 min

Area (ha)= 1.06
Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	84.06	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18

2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Max.Eff.Inten.(mm/hr)=	130.94	62.62	
over (min)	5.00	15.00	
Storage Coeff. (min)=	1.68 (ii)	10.19 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.32	0.09	
		TOTALS	
PEAK FLOW (cms)=	0.06	0.09	0.136 (iii)
TIME TO PEAK (hrs)=	6.17	6.25	6.17
RUNOFF VOLUME (mm)=	97.40	34.72	44.12
TOTAL RAINFALL (mm)=	98.40	98.40	98.40
RUNOFF COEFFICIENT =	0.99	0.35	0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0005)|
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	11.84	1.557	6.25	44.15
+ ID2= 2 (0006):	1.06	0.136	6.17	44.12
=====				
ID = 3 (0005):	12.90	1.661	6.25	44.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0005)|
| 3 + 2 = 1 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0005):	12.90	1.661	6.25	44.14
+ ID2= 2 (0007):	0.31	0.033	6.17	33.95
=====				
ID = 1 (0005):	13.20	1.693	6.25	43.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT= 5.0 min

Area (ha)= 2.93
Total Imp(%)= 30.00 Dir. Conn.(%)= 25.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.88 2.05
Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 139.88 5.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28

2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Max.Eff.Inten.(mm/hr)= 130.94 59.51
over (min) 5.00 10.00
Storage Coeff. (min)= 2.28 (ii) 5.03 (iii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.30 0.16

TOTALS
PEAK FLOW (cms)= 0.27 0.29 0.553 (iii)
TIME TO PEAK (hrs)= 6.17 6.17 6.17
RUNOFF VOLUME (mm)= 97.40 33.99 49.84
TOTAL RAINFALL (mm)= 98.40 98.40 98.40
RUNOFF COEFFICIENT = 0.99 0.35 0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0026)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	2.93	0.553	6.17	49.84
+ ID2= 2 (0005):	13.20	1.693	6.25	43.91
=====				
ID = 3 (0026):	16.14	2.203	6.17	44.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:07 25mm CHI **

READ STORM

Filename: C:\Users\lmattern\AppData\Local\Temp\
a1f0d516-b69d-4367-b06a-562d46ba7241\584b938e

| Ptotal= 24.91 mm |

Comments: 25mm CHI

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.76	1.00	11.75	2.00	3.88	3.00	2.07
0.17	2.00	1.17	57.66	2.17	3.35	3.17	1.93
0.33	2.32	1.33	15.20	2.33	2.96	3.33	1.81
0.50	2.81	1.50	8.31	2.50	2.66	3.50	1.71
0.67	3.61	1.67	5.91	2.67	2.42	3.67	1.62
0.83	5.28	1.83	4.66	2.83	2.23	3.83	1.54

| CALIB
| NASHYD (0002) |
ID= 1 DT= 5.0 min

Area (ha)= 0.94 Curve Number (CN)= 71.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25

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	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Unit Hyd Qpeak (cms)= 0.144

PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 3.201
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.129

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

| CALIB
| NASHYD (0008) |
ID= 1 DT= 5.0 min

Area (ha)= 0.47 Curve Number (CN)= 61.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.21

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	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 2.169
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.087

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

| ADD HYD (0009) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	0.94	0.007	1.58	3.20
+ ID2= 2 (0008):	0.47	0.002	1.58	2.17
=====				
ID = 3 (0009):	1.41	0.009	1.58	2.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB
| NASHYD (0001) |

Area (ha)= 11.84 Curve Number (CN)= 71.0

|ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 0.19

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	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Unit Hyd Qpeak (cms)= 2.380

PEAK FLOW (cms)= 0.098 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 3.197
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.128

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

| CALIB |
| NASHYD (0007) | Area (ha)= 0.31 Curve Number (CN)= 61.0
|ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 0.16

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	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81

0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 2.162
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.087

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

| CALIB |
| STANDHYD (0006) | Area (ha)= 1.06
|ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	84.06	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Max.Eff.Inten.(mm/hr)= 57.66 2.25
over (min) 5.00 35.00
Storage Coeff. (min)= 2.33 (ii) 34.51 (ii)
Unit Hyd. Tpeak (min)= 5.00 35.00
Unit Hyd. peak (cms)= 0.30 0.03

TOTALS
PEAK FLOW (cms)= 0.03 0.00 0.025 (iii)
TIME TO PEAK (hrs)= 1.33 2.00 1.33
RUNOFF VOLUME (mm)= 23.91 2.30 5.52
TOTAL RAINFALL (mm)= 24.91 24.91 24.91
RUNOFF COEFFICIENT = 0.96 0.09 0.22

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0005) |
1 + 2 = 3
ID1= 1 (0001): 11.84 0.098 1.50 3.20
+ ID2= 2 (0006): 1.06 0.025 1.33 5.52
=====

ID = 3 (0005): 12.90 0.106 1.50 3.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0005) |
3 + 2 = 1
ID1= 3 (0005): 12.90 0.106 1.50 3.39
+ ID2= 2 (0007): 0.31 0.002 1.50 2.16
=====

ID = 1 (0005): 13.20 0.107 1.50 3.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0004) | Area (ha)= 2.93

|ID= 1 DT= 5.0 min | Total Imp(%)= 30.00 Dir. Conn.(%)= 25.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.88 2.05
Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 139.88 5.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
0.083 1.76 | 1.083 11.75 | 2.083 3.88 | 3.08 2.07
0.167 1.76 | 1.167 11.75 | 2.167 3.88 | 3.17 2.07
0.250 2.00 | 1.250 57.66 | 2.250 3.35 | 3.25 1.93
0.333 2.00 | 1.333 57.66 | 2.333 3.35 | 3.33 1.93
0.417 2.32 | 1.417 15.20 | 2.417 2.96 | 3.42 1.81
0.500 2.32 | 1.500 15.20 | 2.500 2.96 | 3.50 1.81
0.583 2.81 | 1.583 8.31 | 2.583 2.66 | 3.58 1.71
0.667 2.81 | 1.667 8.31 | 2.667 2.66 | 3.67 1.71
0.750 3.61 | 1.750 5.91 | 2.750 2.42 | 3.75 1.62
0.833 3.61 | 1.833 5.90 | 2.833 2.42 | 3.83 1.62
0.917 5.27 | 1.917 4.66 | 2.917 2.23 | 3.92 1.54
1.000 5.28 | 2.000 4.66 | 3.000 2.23 | 4.00 1.54

Max.Eff.Inten.(mm/hr)= 57.66 3.58
over (min) 5.00 10.00
Storage Coeff. (min)= 3.16 (ii) 6.98 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.27 0.14

TOTALS
PEAK FLOW (cms)= 0.11 0.02 0.124 (iii)
TIME TO PEAK (hrs)= 1.33 1.42 1.33
RUNOFF VOLUME (mm)= 23.91 2.21 7.64
TOTAL RAINFALL (mm)= 24.91 24.91 24.91
RUNOFF COEFFICIENT = 0.96 0.09 0.31

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0026) |
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0004):	2.93	0.124	1.33	7.64
+ ID2= 2 (0005):	13.20	0.107	1.50	3.36
=====				
ID = 3 (0026):	16.14	0.203	1.33	4.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Post Development Model Results

** SIMULATION:01 2yr 12hr 10min SCS Type II **

| CALIB |
| NASHYD (0025) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.21

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	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96

3.000 1.56 | 6.083 59.08 | 9.167 1.62 |
3.083 1.64 | 6.167 59.08 | 9.250 1.55 |

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 7.680
TOTAL RAINFALL (mm)= 44.400
RUNOFF COEFFICIENT = 0.173

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

| CALIB |
| STANDHYD (0018) | Area (ha)= 0.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.16	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	68.51	50.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14

1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Max.Eff.Inten.(mm/hr)= 59.08 10.63
over (min) 5.00 25.00
Storage Coeff. (min)= 2.04 (ii) 21.82 (ii)
Unit Hyd. Tpeak (min)= 5.00 25.00
Unit Hyd. peak (cms)= 0.31 0.05

TOTALS

PEAK FLOW (cms)= 0.02 0.01 0.022 (iii)
TIME TO PEAK (hrs)= 6.17 6.50 6.17
RUNOFF VOLUME (mm)= 43.40 7.96 13.26
TOTAL RAINFALL (mm)= 44.40 44.40 44.40
RUNOFF COEFFICIENT = 0.98 0.18 0.30

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)				
1 + 2 = 3				

ID1= 1 (0018):	0.70	0.022	6.17	13.26
+ ID2= 2 (0025):	0.47	0.010	6.25	7.68

=====

ID = 3 (0020): 1.17 0.030 6.17 11.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0023)			
ID= 1 DT= 5.0 min			

Area (ha)=	0.31	Curve Number (CN)=	61.0
Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
U.H. Tp(hrs)=	0.16		

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	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98

2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.007 (i)
 TIME TO PEAK (hrs)= 6.167
 RUNOFF VOLUME (mm)= 7.656
 TOTAL RAINFALL (mm)= 44.400
 RUNOFF COEFFICIENT = 0.172

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

CALIB	
STANDHYD (0010)	Area (ha)= 11.72
ID= 1 DT= 5.0 min	Total Imp(%)= 28.00 Dir. Conn.(%)= 21.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	8.44
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	279.49	90.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16

1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Max.Eff.Inten.(mm/hr)= 59.08 8.95
 over (min)= 5.00 30.00
 Storage Coeff. (min)= 4.75 (ii) 27.65 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.22 0.04

TOTALS

PEAK FLOW (cms)= 0.39 0.12 0.441 (iii)
 TIME TO PEAK (hrs)= 6.17 6.58 6.17
 RUNOFF VOLUME (mm)= 43.40 7.91 15.36
 TOTAL RAINFALL (mm)= 44.40 44.40 44.40
 RUNOFF COEFFICIENT = 0.98 0.18 0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0022)	Area (ha)= 1.06
ID= 1 DT= 5.0 min	Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 84.06 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20
1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Max.Eff.Inten.(mm/hr)= 59.08 10.63

over (min) 5.00 20.00
Storage Coeff. (min)= 2.31 (ii) 19.61 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.30 0.06

TOTALS

PEAK FLOW (cms)= 0.03 0.01 0.036 (iii)
TIME TO PEAK (hrs)= 6.17 6.42 6.17
RUNOFF VOLUME (mm)= 43.40 7.96 13.26
TOTAL RAINFALL (mm)= 44.40 44.40 44.40
RUNOFF COEFFICIENT = 0.98 0.18 0.30

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0014) |
1 + 2 = 3
ID1= 1 (0010): 11.72 0.441 6.17 15.36
+ ID2= 2 (0022): 1.06 0.036 6.17 13.26
=====

ID = 3 (0014): 12.78 0.476 6.17 15.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0014) |
3 + 2 = 1
ID1= 3 (0014): 12.78 0.476 6.17 15.19
+ ID2= 2 (0023): 0.31 0.007 6.17 7.66
=====

ID = 1 (0014): 13.08 0.483 6.17 15.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0021) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
| OUTFLOW STORAGE | OUTFLOW STORAGE

	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.1118	0.0844
	0.0019	0.0096	0.2872	0.0962
	0.0062	0.0195	0.5139	0.1082
	0.0088	0.0296	0.7822	0.1206
	0.0108	0.0400	1.0863	0.1332
	0.0124	0.0507	1.4223	0.1461
	0.0139	0.0616	1.7876	0.1592
	0.0152	0.0729	2.1799	0.1725

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0014)	13.082	0.483	6.17	15.01
OUTFLOW: ID= 1 (0021)	13.082	0.166	6.67	14.91

PEAK FLOW REDUCTION [Qout/Qin](%)= 34.34
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.0880

CALIB	
STANDHYD (0017)	Area (ha)= 0.36
ID= 1 DT= 5.0 min	Total Imp(%)= 25.00 Dir. Conn.(%)= 18.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.27
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	48.83	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	1.64	6.250	9.53	9.33	1.55
0.167	0.00	3.250	1.69	6.333	9.53	9.42	1.49
0.250	0.96	3.333	1.69	6.417	7.60	9.50	1.49
0.333	0.96	3.417	1.69	6.500	7.60	9.58	1.43
0.417	0.98	3.500	1.69	6.583	5.68	9.67	1.43
0.500	0.98	3.583	1.69	6.667	5.68	9.75	1.37
0.583	0.99	3.667	1.69	6.750	4.35	9.83	1.37
0.667	0.99	3.750	1.77	6.833	4.35	9.92	1.31
0.750	1.01	3.833	1.77	6.917	3.91	10.00	1.31
0.833	1.01	3.917	1.90	7.000	3.91	10.08	1.25
0.917	1.03	4.000	1.90	7.083	3.47	10.17	1.25
1.000	1.03	4.083	2.04	7.167	3.47	10.25	1.20

1.083	1.05	4.167	2.04	7.250	3.09	10.33	1.20
1.167	1.05	4.250	2.23	7.333	3.09	10.42	1.18
1.250	1.07	4.333	2.23	7.417	2.85	10.50	1.18
1.333	1.07	4.417	2.43	7.500	2.85	10.58	1.16
1.417	1.08	4.500	2.43	7.583	2.61	10.67	1.16
1.500	1.08	4.583	2.63	7.667	2.61	10.75	1.14
1.583	1.10	4.667	2.63	7.750	2.39	10.83	1.14
1.667	1.10	4.750	2.94	7.833	2.39	10.92	1.12
1.750	1.12	4.833	2.94	7.917	2.22	11.00	1.12
1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Max.Eff.Inten.(mm/hr)=	59.08	14.13
over (min)	5.00	10.00
Storage Coeff. (min)=	1.67 (ii)	6.09 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.32	0.15

TOTALS

PEAK FLOW (cms)=	0.01	0.01	0.019 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	43.40	7.88	14.26
TOTAL RAINFALL (mm)=	44.40	44.40	44.40
RUNOFF COEFFICIENT =	0.98	0.18	0.32

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD ( 0016)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0017):   0.36   0.019   6.17   14.26
+ ID2= 2 ( 0021):  13.08   0.166   6.67   14.91
=====
ID = 3 ( 0016):   13.44   0.169   6.67   14.90

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| CALIB
| STANDHYD ( 0024)|
| ID= 1 DT= 5.0 min |
-----
          Area   (ha)=   2.93
          Total Imp(%)= 30.00   Dir. Conn.(%)= 25.00

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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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-----
          TIME RAIN   TIME RAIN   TIME RAIN   TIME RAIN
          hrs mm/hr  hrs mm/hr  hrs mm/hr  hrs mm/hr
0.083  0.00  3.167  1.64  6.250  9.53  9.33  1.55
0.167  0.00  3.250  1.69  6.333  9.53  9.42  1.49
0.250  0.96  3.333  1.69  6.417  7.60  9.50  1.49
0.333  0.96  3.417  1.69  6.500  7.60  9.58  1.43
0.417  0.98  3.500  1.69  6.583  5.68  9.67  1.43
0.500  0.98  3.583  1.69  6.667  5.68  9.75  1.37
0.583  0.99  3.667  1.69  6.750  4.35  9.83  1.37
0.667  0.99  3.750  1.77  6.833  4.35  9.92  1.31
0.750  1.01  3.833  1.77  6.917  3.91  10.00  1.31
0.833  1.01  3.917  1.90  7.000  3.91  10.08  1.25
0.917  1.03  4.000  1.90  7.083  3.47  10.17  1.25
1.000  1.03  4.083  2.04  7.167  3.47  10.25  1.20
1.083  1.05  4.167  2.04  7.250  3.09  10.33  1.20
1.167  1.05  4.250  2.23  7.333  3.09  10.42  1.18
1.250  1.07  4.333  2.23  7.417  2.85  10.50  1.18
1.333  1.07  4.417  2.43  7.500  2.85  10.58  1.16
1.417  1.08  4.500  2.43  7.583  2.61  10.67  1.16
1.500  1.08  4.583  2.63  7.667  2.61  10.75  1.14
1.583  1.10  4.667  2.63  7.750  2.39  10.83  1.14
1.667  1.10  4.750  2.94  7.833  2.39  10.92  1.12
1.750  1.12  4.833  2.94  7.917  2.22  11.00  1.12

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1.833	1.12	4.917	3.27	8.000	2.22	11.08	1.09
1.917	1.14	5.000	3.27	8.083	2.05	11.17	1.09
2.000	1.14	5.083	3.61	8.167	2.05	11.25	1.07
2.083	1.15	5.167	3.61	8.250	1.92	11.33	1.07
2.167	1.15	5.250	4.26	8.333	1.92	11.42	1.05
2.250	1.21	5.333	4.26	8.417	1.86	11.50	1.05
2.333	1.21	5.417	5.07	8.500	1.86	11.58	1.03
2.417	1.29	5.500	5.07	8.583	1.80	11.67	1.03
2.500	1.29	5.583	5.88	8.667	1.80	11.75	1.00
2.583	1.38	5.667	5.88	8.750	1.73	11.83	1.00
2.667	1.38	5.750	17.59	8.833	1.73	11.92	0.98
2.750	1.47	5.833	17.59	8.917	1.68	12.00	0.98
2.833	1.47	5.917	43.70	9.000	1.68	12.08	0.96
2.917	1.56	6.000	43.70	9.083	1.62	12.17	0.96
3.000	1.56	6.083	59.08	9.167	1.62		
3.083	1.64	6.167	59.08	9.250	1.55		

Max.Eff.Inten.(mm/hr)=	59.08	13.57
over (min)	5.00	10.00
Storage Coeff. (min)=	3.13 (ii)	6.91 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.27	0.14

TOTALS

PEAK FLOW (cms)=	0.12	0.06	0.177 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	43.40	7.72	16.64
TOTAL RAINFALL (mm)=	44.40	44.40	44.40
RUNOFF COEFFICIENT =	0.98	0.17	0.37

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0027)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0016):   13.44   0.169   6.67   14.90
+ ID2= 2 ( 0024):   2.93   0.177   6.17   16.64
=====
ID = 3 ( 0027):   16.37   0.210   6.17   15.21

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:02 5yr 12hr 10min SCS Type II **

| CALIB |
| NASHYD (0025) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.21

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	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27

3.000	2.06	6.083	78.25	9.167	2.14
3.083	2.17	6.167	78.24	9.250	2.05

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 13.366
TOTAL RAINFALL (mm)= 58.800
RUNOFF COEFFICIENT = 0.227

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

| CALIB |
| STANDHYD (0018) | Area (ha)= 0.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.16	0.54
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	68.51	50.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50

1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Max.Eff.Inten.(mm/hr)= 78.25 18.66
over (min) 5.00 20.00
Storage Coeff. (min)= 1.82 (ii) 17.62 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.32 0.06

TOTALS

PEAK FLOW (cms)= 0.02 0.02 0.035 (iii)
TIME TO PEAK (hrs)= 6.17 6.33 6.17
RUNOFF VOLUME (mm)= 57.80 13.75 20.34
TOTAL RAINFALL (mm)= 58.80 58.80 58.80
RUNOFF COEFFICIENT = 0.98 0.23 0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0018):	0.70	0.035	6.17	20.34
+ ID2= 2 (0025):	0.47	0.017	6.25	13.37

=====

ID = 3 (0020): 1.17 0.050 6.17 17.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	0.31	Curve Number (CN)=	61.0
NASHYD (0023)	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.16		

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	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30

2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.013 (i)
 TIME TO PEAK (hrs)= 6.167
 RUNOFF VOLUME (mm)= 13.327
 TOTAL RAINFALL (mm)= 58.800
 RUNOFF COEFFICIENT = 0.227

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

 | CALIB |
 | STANDHYD (0010) | Area (ha)= 11.72
 | ID= 1 DT= 5.0 min | Total Imp(%)= 28.00 Dir. Conn.(%)= 21.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.28	8.44
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	2.00	5.00
Length	(m)=	279.49	90.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54

1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Max.Eff.Inten.(mm/hr)= 78.25 18.44
 over (min)= 5.00 25.00
 Storage Coeff. (min)= 4.24 (ii) 21.39 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.24 0.05

TOTALS
 PEAK FLOW (cms)= 0.52 0.24 0.654 (iii)
 TIME TO PEAK (hrs)= 6.17 6.42 6.17
 RUNOFF VOLUME (mm)= 57.80 13.68 22.94
 TOTAL RAINFALL (mm)= 58.80 58.80 58.80
 RUNOFF COEFFICIENT = 0.98 0.23 0.39

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | CALIB |
 | STANDHYD (0022) | Area (ha)= 1.06
 | ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.82

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 84.06 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59
1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Max.Eff.Inten.(mm/hr)= 78.25 21.20

over (min) 5.00 20.00
Storage Coeff. (min)= 2.06 (ii) 15.19 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.31 0.07

TOTALS

PEAK FLOW (cms)= 0.03 0.03 0.055 (iii)
TIME TO PEAK (hrs)= 6.17 6.33 6.17
RUNOFF VOLUME (mm)= 57.80 13.75 20.35
TOTAL RAINFALL (mm)= 58.80 58.80 58.80
RUNOFF COEFFICIENT = 0.98 0.23 0.35

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0014) |
1 + 2 = 3
ID1= 1 (0010): 11.72 0.654 6.17 22.94
+ ID2= 2 (0022): 1.06 0.055 6.17 20.35
=====

ID = 3 (0014): 12.78 0.709 6.17 22.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0014) |
3 + 2 = 1
ID1= 3 (0014): 12.78 0.709 6.17 22.73
+ ID2= 2 (0023): 0.31 0.013 6.17 13.33
=====

ID = 1 (0014): 13.08 0.721 6.17 22.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0021) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
| OUTFLOW STORAGE | OUTFLOW STORAGE

	(cms)	(ha.m.)	(cms)	(ha.m.)
0.0000	0.0000	0.1118	0.0844	
0.0019	0.0096	0.2872	0.0962	
0.0062	0.0195	0.5139	0.1082	
0.0088	0.0296	0.7822	0.1206	
0.0108	0.0400	1.0863	0.1332	
0.0124	0.0507	1.4223	0.1461	
0.0139	0.0616	1.7876	0.1592	
0.0152	0.0729	2.1799	0.1725	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0014)	13.082	0.721	6.17	22.51
OUTFLOW: ID= 1 (0021)	13.082	0.387	6.33	22.41

PEAK FLOW REDUCTION [Qout/Qin](%)= 53.70
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.1016

CALIB	
STANDHYD (0017)	Area (ha)= 0.36
ID= 1 DT= 5.0 min	Total Imp(%)= 25.00 Dir. Conn.(%)= 18.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.27
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	48.83	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.17	6.250	12.62	9.33	2.05
0.167	0.00	3.250	2.24	6.333	12.62	9.42	1.98
0.250	1.27	3.333	2.24	6.417	10.07	9.50	1.98
0.333	1.27	3.417	2.24	6.500	10.07	9.58	1.90
0.417	1.29	3.500	2.24	6.583	7.52	9.67	1.90
0.500	1.29	3.583	2.24	6.667	7.52	9.75	1.81
0.583	1.32	3.667	2.24	6.750	5.76	9.83	1.81
0.667	1.32	3.750	2.34	6.833	5.76	9.92	1.73
0.750	1.34	3.833	2.34	6.917	5.17	10.00	1.73
0.833	1.34	3.917	2.52	7.000	5.17	10.08	1.65
0.917	1.36	4.000	2.52	7.083	4.59	10.17	1.65
1.000	1.36	4.083	2.70	7.167	4.59	10.25	1.59

1.083	1.39	4.167	2.70	7.250	4.09	10.33	1.59
1.167	1.39	4.250	2.95	7.333	4.09	10.42	1.56
1.250	1.41	4.333	2.95	7.417	3.78	10.50	1.56
1.333	1.41	4.417	3.22	7.500	3.78	10.58	1.54
1.417	1.43	4.500	3.22	7.583	3.46	10.67	1.54
1.500	1.43	4.583	3.48	7.667	3.46	10.75	1.50
1.583	1.46	4.667	3.48	7.750	3.16	10.83	1.50
1.667	1.46	4.750	3.89	7.833	3.16	10.92	1.48
1.750	1.48	4.833	3.89	7.917	2.94	11.00	1.48
1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Max.Eff.Inten.(mm/hr)=	78.25	24.43
over (min)	5.00	10.00
Storage Coeff. (min)=	1.49 (ii)	5.45 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.16

TOTALS

PEAK FLOW (cms)=	0.01	0.01	0.029 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	57.80	13.63	21.58
TOTAL RAINFALL (mm)=	58.80	58.80	58.80
RUNOFF COEFFICIENT =	0.98	0.23	0.37

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0016) |
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0017):    0.36    0.029    6.17    21.58
+ ID2= 2 ( 0021):   13.08    0.387    6.33    22.41
=====
ID = 3 ( 0016):   13.44    0.397    6.33    22.39

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| CALIB |
| STANDHYD ( 0024) |
| ID= 1 DT= 5.0 min |
-----
          Area    (ha)=    2.93
          Total Imp(%)= 30.00    Dir. Conn.(%)= 25.00

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

-----
          TIME RAIN    TIME RAIN    TIME RAIN    TIME RAIN
          hrs mm/hr   hrs mm/hr   hrs mm/hr   hrs mm/hr
0.083 0.00 | 3.167 2.17 | 6.250 12.62 | 9.33 2.05
0.167 0.00 | 3.250 2.24 | 6.333 12.62 | 9.42 1.98
0.250 1.27 | 3.333 2.24 | 6.417 10.07 | 9.50 1.98
0.333 1.27 | 3.417 2.24 | 6.500 10.07 | 9.58 1.90
0.417 1.29 | 3.500 2.24 | 6.583 7.52 | 9.67 1.90
0.500 1.29 | 3.583 2.24 | 6.667 7.52 | 9.75 1.81
0.583 1.32 | 3.667 2.24 | 6.750 5.76 | 9.83 1.81
0.667 1.32 | 3.750 2.34 | 6.833 5.76 | 9.92 1.73
0.750 1.34 | 3.833 2.34 | 6.917 5.17 | 10.00 1.73
0.833 1.34 | 3.917 2.52 | 7.000 5.17 | 10.08 1.65
0.917 1.36 | 4.000 2.52 | 7.083 4.59 | 10.17 1.65
1.000 1.36 | 4.083 2.70 | 7.167 4.59 | 10.25 1.59
1.083 1.39 | 4.167 2.70 | 7.250 4.09 | 10.33 1.59
1.167 1.39 | 4.250 2.95 | 7.333 4.09 | 10.42 1.56
1.250 1.41 | 4.333 2.95 | 7.417 3.78 | 10.50 1.56
1.333 1.41 | 4.417 3.22 | 7.500 3.78 | 10.58 1.54
1.417 1.43 | 4.500 3.22 | 7.583 3.46 | 10.67 1.54
1.500 1.43 | 4.583 3.48 | 7.667 3.46 | 10.75 1.50
1.583 1.46 | 4.667 3.48 | 7.750 3.16 | 10.83 1.50
1.667 1.46 | 4.750 3.89 | 7.833 3.16 | 10.92 1.48
1.750 1.48 | 4.833 3.89 | 7.917 2.94 | 11.00 1.48

```

1.833	1.48	4.917	4.33	8.000	2.94	11.08	1.45
1.917	1.50	5.000	4.33	8.083	2.71	11.17	1.45
2.000	1.50	5.083	4.78	8.167	2.71	11.25	1.42
2.083	1.53	5.167	4.78	8.250	2.54	11.33	1.42
2.167	1.53	5.250	5.64	8.333	2.54	11.42	1.39
2.250	1.60	5.333	5.64	8.417	2.47	11.50	1.39
2.333	1.60	5.417	6.71	8.500	2.47	11.58	1.36
2.417	1.71	5.500	6.71	8.583	2.39	11.67	1.36
2.500	1.71	5.583	7.79	8.667	2.39	11.75	1.33
2.583	1.82	5.667	7.79	8.750	2.30	11.83	1.33
2.667	1.82	5.750	23.29	8.833	2.30	11.92	1.30
2.750	1.95	5.833	23.29	8.917	2.22	12.00	1.30
2.833	1.95	5.917	57.87	9.000	2.22	12.08	1.27
2.917	2.06	6.000	57.87	9.083	2.14	12.17	1.27
3.000	2.06	6.083	78.25	9.167	2.14		
3.083	2.17	6.167	78.24	9.250	2.05		

Max.Eff.Inten.(mm/hr)=	78.25	23.51
over (min)	5.00	10.00
Storage Coeff. (min)=	2.80 (ii)	6.17 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.28	0.15

TOTALS

PEAK FLOW (cms)=	0.16	0.11	0.264 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	57.80	13.39	24.49
TOTAL RAINFALL (mm)=	58.80	58.80	58.80
RUNOFF COEFFICIENT =	0.98	0.23	0.42

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0027) |
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0016):   13.44    0.397    6.33    22.39
+ ID2= 2 ( 0024):    2.93    0.264    6.17    24.49
=====
ID = 3 ( 0027):   16.37    0.527    6.25    22.77

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:03 10yr 12hr 10min SCS Type II **

| CALIB |
| NASHYD (0025) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.21

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	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48

3.000 2.40 | 6.083 91.02 | 9.167 2.49 |
3.083 2.53 | 6.167 91.02 | 9.250 2.39 |

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.023 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 17.773
TOTAL RAINFALL (mm)= 68.400
RUNOFF COEFFICIENT = 0.260

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

| CALIB |
| STANDHYD (0018) | Area (ha)= 0.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	68.51	50.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75

1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Max.Eff.Inten.(mm/hr)= 91.02 28.19
over (min) 5.00 20.00
Storage Coeff. (min)= 1.72 (ii) 15.11 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.32 0.07

TOTALS

PEAK FLOW (cms)= 0.03 0.03 0.045 (iii)
TIME TO PEAK (hrs)= 6.17 6.33 6.17
RUNOFF VOLUME (mm)= 67.40 18.23 25.59
TOTAL RAINFALL (mm)= 68.40 68.40 68.40
RUNOFF COEFFICIENT = 0.99 0.27 0.37

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0018):	0.70	0.045	6.17	25.59
+ ID2= 2 (0025):	0.47	0.023	6.25	17.77

=====

ID = 3 (0020): 1.17 0.065 6.17 22.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	0.31	Curve Number (CN)=	61.0
NASHYD (0023)	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.16		

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	0.00	3.167	2.53	6.250	14.68	9.333	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51

2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.017 (i)
 TIME TO PEAK (hrs)= 6.167
 RUNOFF VOLUME (mm)= 17.720
 TOTAL RAINFALL (mm)= 68.400
 RUNOFF COEFFICIENT = 0.259

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

CALIB			
STANDHYD (0010)	Area (ha)= 11.72		
ID= 1 DT= 5.0 min	Total Imp(%)= 28.00	Dir. Conn.(%)= 21.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	8.44
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	279.49	90.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79

1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Max.Eff.Inten.(mm/hr)= 91.02 27.88
 over (min) 5.00 20.00
 Storage Coeff. (min)= 3.99 (ii) 18.53 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.24 0.06

TOTALS

PEAK FLOW (cms)= 0.61 0.36 0.855 (iii)
 TIME TO PEAK (hrs)= 6.17 6.33 6.17
 RUNOFF VOLUME (mm)= 67.40 18.14 28.48
 TOTAL RAINFALL (mm)= 68.40 68.40 68.40
 RUNOFF COEFFICIENT = 0.99 0.27 0.42

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0022)	Area (ha)= 1.06		
ID= 1 DT= 5.0 min	Total Imp(%)= 23.00	Dir. Conn.(%)= 15.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 84.06 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85
1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Max.Eff.Inten.(mm/hr)= 91.02 28.19

over (min) 5.00 15.00
Storage Coeff. (min)= 1.94 (ii) 13.65 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.31 0.08

TOTALS

PEAK FLOW (cms)= 0.04 0.04 0.075 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 67.40 18.23 25.60
TOTAL RAINFALL (mm)= 68.40 68.40 68.40
RUNOFF COEFFICIENT = 0.99 0.27 0.37

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0014) |
1 + 2 = 3
ID1= 1 (0010): 11.72 0.855 6.17 28.48
+ ID2= 2 (0022): 1.06 0.075 6.17 25.60
=====

ID = 3 (0014): 12.78 0.930 6.17 28.24

| ADD HYD (0014) |
3 + 2 = 1
ID1= 3 (0014): 12.78 0.930 6.17 28.24
+ ID2= 2 (0023): 0.31 0.017 6.17 17.72
=====

ID = 1 (0014): 13.08 0.947 6.17 28.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0021) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
DT= 5.0 min
OUTFLOW STORAGE | OUTFLOW STORAGE

	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.1118	0.0844
	0.0019	0.0096	0.2872	0.0962
	0.0062	0.0195	0.5139	0.1082
	0.0088	0.0296	0.7822	0.1206
	0.0108	0.0400	1.0863	0.1332
	0.0124	0.0507	1.4223	0.1461
	0.0139	0.0616	1.7876	0.1592
	0.0152	0.0729	2.1799	0.1725

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0014)	13.082	0.947	6.17	28.00
OUTFLOW: ID= 1 (0021)	13.082	0.628	6.25	27.90

PEAK FLOW REDUCTION [Qout/Qin](%)= 66.26
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.1135

CALIB			
STANDHYD (0017)	Area (ha)= 0.36		
ID= 1 DT= 5.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 18.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.27
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	48.83	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.53	6.250	14.68	9.33	2.39
0.167	0.00	3.250	2.60	6.333	14.68	9.42	2.30
0.250	1.48	3.333	2.60	6.417	11.71	9.50	2.30
0.333	1.48	3.417	2.60	6.500	11.71	9.58	2.21
0.417	1.50	3.500	2.60	6.583	8.74	9.67	2.21
0.500	1.50	3.583	2.60	6.667	8.74	9.75	2.10
0.583	1.53	3.667	2.60	6.750	6.70	9.83	2.10
0.667	1.53	3.750	2.72	6.833	6.70	9.92	2.01
0.750	1.56	3.833	2.72	6.917	6.02	10.00	2.01
0.833	1.56	3.917	2.93	7.000	6.02	10.08	1.92
0.917	1.59	4.000	2.93	7.083	5.34	10.17	1.92
1.000	1.59	4.083	3.14	7.167	5.34	10.25	1.85

1.083	1.61	4.167	3.14	7.250	4.76	10.33	1.85
1.167	1.61	4.250	3.43	7.333	4.76	10.42	1.82
1.250	1.64	4.333	3.43	7.417	4.39	10.50	1.82
1.333	1.64	4.417	3.74	7.500	4.39	10.58	1.79
1.417	1.67	4.500	3.74	7.583	4.03	10.67	1.79
1.500	1.67	4.583	4.05	7.667	4.03	10.75	1.75
1.583	1.69	4.667	4.05	7.750	3.68	10.83	1.75
1.667	1.69	4.750	4.52	7.833	3.68	10.92	1.72
1.750	1.72	4.833	4.52	7.917	3.42	11.00	1.72
1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Max.Eff.Inten.(mm/hr)=	91.02	32.38
over (min)	5.00	10.00
Storage Coeff. (min)=	1.40 (ii)	5.13 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.16

TOTALS

PEAK FLOW (cms)=	0.02	0.02	0.036 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	67.40	18.08	26.95
TOTAL RAINFALL (mm)=	68.40	68.40	68.40
RUNOFF COEFFICIENT =	0.99	0.26	0.39

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0016)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0017):   0.36   0.036   6.17   26.95
+ ID2= 2 ( 0021):  13.08   0.628   6.25   27.90
=====
ID = 3 ( 0016):   13.44   0.649   6.25   27.88

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| CALIB
| STANDHYD ( 0024)|
| ID= 1 DT= 5.0 min|
-----
          Area   (ha)=   2.93
          Total Imp(%)= 30.00   Dir. Conn.(%)= 25.00

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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

-----
          TIME RAIN   TIME RAIN   TIME RAIN   TIME RAIN
          hrs mm/hr  hrs mm/hr  hrs mm/hr  hrs mm/hr
0.083  0.00  3.167  2.53  6.250  14.68  9.33  2.39
0.167  0.00  3.250  2.60  6.333  14.68  9.42  2.30
0.250  1.48  3.333  2.60  6.417  11.71  9.50  2.30
0.333  1.48  3.417  2.60  6.500  11.71  9.58  2.21
0.417  1.50  3.500  2.60  6.583  8.74  9.67  2.21
0.500  1.50  3.583  2.60  6.667  8.74  9.75  2.10
0.583  1.53  3.667  2.60  6.750  6.70  9.83  2.10
0.667  1.53  3.750  2.72  6.833  6.70  9.92  2.01
0.750  1.56  3.833  2.72  6.917  6.02  10.00  2.01
0.833  1.56  3.917  2.93  7.000  6.02  10.08  1.92
0.917  1.59  4.000  2.93  7.083  5.34  10.17  1.92
1.000  1.59  4.083  3.14  7.167  5.34  10.25  1.85
1.083  1.61  4.167  3.14  7.250  4.76  10.33  1.85
1.167  1.61  4.250  3.43  7.333  4.76  10.42  1.82
1.250  1.64  4.333  3.43  7.417  4.39  10.50  1.82
1.333  1.64  4.417  3.74  7.500  4.39  10.58  1.79
1.417  1.67  4.500  3.74  7.583  4.03  10.67  1.79
1.500  1.67  4.583  4.05  7.667  4.03  10.75  1.75
1.583  1.69  4.667  4.05  7.750  3.68  10.83  1.75
1.667  1.69  4.750  4.52  7.833  3.68  10.92  1.72
1.750  1.72  4.833  4.52  7.917  3.42  11.00  1.72

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1.833	1.72	4.917	5.04	8.000	3.42	11.08	1.69
1.917	1.75	5.000	5.04	8.083	3.16	11.17	1.69
2.000	1.75	5.083	5.56	8.167	3.16	11.25	1.65
2.083	1.77	5.167	5.56	8.250	2.96	11.33	1.65
2.167	1.77	5.250	6.56	8.333	2.96	11.42	1.62
2.250	1.86	5.333	6.56	8.417	2.87	11.50	1.62
2.333	1.86	5.417	7.81	8.500	2.87	11.58	1.58
2.417	1.99	5.500	7.81	8.583	2.78	11.67	1.58
2.500	1.99	5.583	9.06	8.667	2.78	11.75	1.55
2.583	2.12	5.667	9.06	8.750	2.67	11.83	1.55
2.667	2.12	5.750	27.09	8.833	2.67	11.92	1.51
2.750	2.27	5.833	27.09	8.917	2.58	12.00	1.51
2.833	2.27	5.917	67.32	9.000	2.58	12.08	1.48
2.917	2.40	6.000	67.32	9.083	2.49	12.17	1.48
3.000	2.40	6.083	91.02	9.167	2.49		
3.083	2.53	6.167	91.02	9.250	2.39		

Max.Eff.Inten.(mm/hr)=	91.02	31.20
over (min)	5.00	10.00
Storage Coeff. (min)=	2.64 (ii)	5.81 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.29	0.15

TOTALS

PEAK FLOW (cms)=	0.18	0.14	0.328 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	67.40	17.78	30.18
TOTAL RAINFALL (mm)=	68.40	68.40	68.40
RUNOFF COEFFICIENT =	0.99	0.26	0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0027)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0016):   13.44   0.649   6.25   27.88
+ ID2= 2 ( 0024):   2.93   0.328   6.17   30.18
=====
ID = 3 ( 0027):   16.37   0.843   6.17   28.29

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:04 25yr 12hr 10min SCS Type II **

| CALIB |
| NASHYD (0025) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.21

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	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74

3.000 2.82 | 6.083 106.99 | 9.167 2.93 |
3.083 2.97 | 6.167 106.99 | 9.250 2.81 |

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.031 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 23.869
TOTAL RAINFALL (mm)= 80.400
RUNOFF COEFFICIENT = 0.297

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

| CALIB |
| STANDHYD (0018) | Area (ha)= 0.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	68.51	50.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06

1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Max.Eff.Inten.(mm/hr)= 106.99 37.88
over (min) 5.00 15.00
Storage Coeff. (min)= 1.61 (ii) 13.51 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.32 0.08

TOTALS

PEAK FLOW (cms)= 0.03 0.04 0.063 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 79.40 24.42 32.65
TOTAL RAINFALL (mm)= 80.40 80.40 80.40
RUNOFF COEFFICIENT = 0.99 0.30 0.41

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0020) |
1 + 2 = 3
ID1= 1 (0018): 0.70 0.063 6.17 32.65
+ ID2= 2 (0025): 0.47 0.031 6.25 23.87

=====

ID = 3 (0020): 1.17 0.091 6.17 29.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0023) | Area (ha)= 0.31 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.16

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	0.00	3.167	2.97	6.250	17.25	9.333	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78

2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.023 (i)
 TIME TO PEAK (hrs)= 6.167
 RUNOFF VOLUME (mm)= 23.799
 TOTAL RAINFALL (mm)= 80.400
 RUNOFF COEFFICIENT = 0.296

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

 | CALIB |
 | STANDHYD (0010) | Area (ha)= 11.72
 | ID= 1 DT= 5.0 min | Total Imp(%)= 28.00 Dir. Conn.(%)= 21.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.28	8.44
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	2.00	5.00
Length	(m)=	279.49	90.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10

1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Max.Eff.Inten.(mm/hr)= 106.99 37.47
 over (min) 5.00 20.00
 Storage Coeff. (min)= 3.74 (ii) 16.66 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.25 0.06

TOTALS

PEAK FLOW (cms)= 0.72 0.51 1.076 (iii)
 TIME TO PEAK (hrs)= 6.17 6.33 6.17
 RUNOFF VOLUME (mm)= 79.40 24.30 35.87
 TOTAL RAINFALL (mm)= 80.40 80.40 80.40
 RUNOFF COEFFICIENT = 0.99 0.30 0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | CALIB |
 | STANDHYD (0022) | Area (ha)= 1.06
 | ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.82

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 84.06 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18
1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Max.Eff.Inten.(mm/hr)= 106.99 44.09

over (min) 5.00 15.00
Storage Coeff. (min)= 1.82 (ii) 11.61 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.32 0.09
TOTALS
PEAK FLOW (cms)= 0.05 0.06 0.099 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 79.40 24.42 32.66
TOTAL RAINFALL (mm)= 80.40 80.40 80.40
RUNOFF COEFFICIENT = 0.99 0.30 0.41

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0014) |
1 + 2 = 3
ID1= 1 (0010): 11.72 1.076 6.17 35.87
+ ID2= 2 (0022): 1.06 0.099 6.17 32.66
=====

ID = 3 (0014): 12.78 1.174 6.17 35.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0014) |
3 + 2 = 1
ID1= 3 (0014): 12.78 1.174 6.17 35.60
+ ID2= 2 (0023): 0.31 0.023 6.17 23.80
=====

ID = 1 (0014): 13.08 1.197 6.17 35.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0021) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
OUTFLOW STORAGE | OUTFLOW STORAGE

	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.1118	0.0844
	0.0019	0.0096	0.2872	0.0962
	0.0062	0.0195	0.5139	0.1082
	0.0088	0.0296	0.7822	0.1206
	0.0108	0.0400	1.0863	0.1332
	0.0124	0.0507	1.4223	0.1461
	0.0139	0.0616	1.7876	0.1592
	0.0152	0.0729	2.1799	0.1725
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0014)	13.082	1.197	6.17	35.33
OUTFLOW: ID= 1 (0021)	13.082	0.892	6.25	35.23
PEAK FLOW REDUCTION [Qout/Qin](%)=	74.51			
TIME SHIFT OF PEAK FLOW (min)=	5.00			
MAXIMUM STORAGE USED (ha.m.)=	0.1262			

CALIB	Area (ha)=	0.36
STANDHYD (0017)	Total Imp(%)=	25.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	18.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.27
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	48.83	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.97	6.250	17.25	9.33	2.81
0.167	0.00	3.250	3.06	6.333	17.25	9.42	2.70
0.250	1.74	3.333	3.06	6.417	13.77	9.50	2.70
0.333	1.74	3.417	3.06	6.500	13.77	9.58	2.59
0.417	1.77	3.500	3.06	6.583	10.28	9.67	2.59
0.500	1.77	3.583	3.06	6.667	10.28	9.75	2.47
0.583	1.80	3.667	3.06	6.750	7.87	9.83	2.47
0.667	1.80	3.750	3.20	6.833	7.87	9.92	2.37
0.750	1.83	3.833	3.20	6.917	7.07	10.00	2.37
0.833	1.83	3.917	3.44	7.000	7.07	10.08	2.26
0.917	1.86	4.000	3.44	7.083	6.28	10.17	2.26
1.000	1.86	4.083	3.69	7.167	6.28	10.25	2.18

1.083	1.89	4.167	3.69	7.250	5.59	10.33	2.18
1.167	1.89	4.250	4.03	7.333	5.59	10.42	2.14
1.250	1.93	4.333	4.03	7.417	5.16	10.50	2.14
1.333	1.93	4.417	4.40	7.500	5.16	10.58	2.10
1.417	1.96	4.500	4.40	7.583	4.73	10.67	2.10
1.500	1.96	4.583	4.76	7.667	4.73	10.75	2.06
1.583	1.99	4.667	4.76	7.750	4.32	10.83	2.06
1.667	1.99	4.750	5.32	7.833	4.32	10.92	2.02
1.750	2.02	4.833	5.32	7.917	4.02	11.00	2.02
1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Max.Eff.Inten.(mm/hr)=	106.99	43.35
over (min)	5.00	5.00
Storage Coeff. (min)=	1.31 (ii)	4.81 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.22

TOTALS

PEAK FLOW (cms)=	0.02	0.03	0.050 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	79.40	24.23	34.15
TOTAL RAINFALL (mm)=	80.40	80.40	80.40
RUNOFF COEFFICIENT =	0.99	0.30	0.42

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0016)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0017):   0.36   0.050   6.17   34.15
+ ID2= 2 ( 0021):  13.08   0.892   6.25   35.23
=====
ID = 3 ( 0016):   13.44   0.910   6.25   35.20

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| CALIB
| STANDHYD ( 0024)|
| ID= 1 DT= 5.0 min |
-----
          Area   (ha)=   2.93
          Total Imp(%)= 30.00   Dir. Conn.(%)= 25.00

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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

-----
          TIME RAIN   TIME RAIN   TIME RAIN   TIME RAIN
          hrs mm/hr  hrs mm/hr  hrs mm/hr  hrs mm/hr
0.083  0.00  3.167  2.97  6.250  17.25  9.33  2.81
0.167  0.00  3.250  3.06  6.333  17.25  9.42  2.70
0.250  1.74  3.333  3.06  6.417  13.77  9.50  2.70
0.333  1.74  3.417  3.06  6.500  13.77  9.58  2.59
0.417  1.77  3.500  3.06  6.583  10.28  9.67  2.59
0.500  1.77  3.583  3.06  6.667  10.28  9.75  2.47
0.583  1.80  3.667  3.06  6.750  7.87  9.83  2.47
0.667  1.80  3.750  3.20  6.833  7.87  9.92  2.37
0.750  1.83  3.833  3.20  6.917  7.07  10.00  2.37
0.833  1.83  3.917  3.44  7.000  7.07  10.08  2.26
0.917  1.86  4.000  3.44  7.083  6.28  10.17  2.26
1.000  1.86  4.083  3.69  7.167  6.28  10.25  2.18
1.083  1.89  4.167  3.69  7.250  5.59  10.33  2.18
1.167  1.89  4.250  4.03  7.333  5.59  10.42  2.14
1.250  1.93  4.333  4.03  7.417  5.16  10.50  2.14
1.333  1.93  4.417  4.40  7.500  5.16  10.58  2.10
1.417  1.96  4.500  4.40  7.583  4.73  10.67  2.10
1.500  1.96  4.583  4.76  7.667  4.73  10.75  2.06
1.583  1.99  4.667  4.76  7.750  4.32  10.83  2.06
1.667  1.99  4.750  5.32  7.833  4.32  10.92  2.02
1.750  2.02  4.833  5.32  7.917  4.02  11.00  2.02

```

1.833	2.02	4.917	5.93	8.000	4.02	11.08	1.98
1.917	2.06	5.000	5.93	8.083	3.71	11.17	1.98
2.000	2.06	5.083	6.54	8.167	3.71	11.25	1.94
2.083	2.09	5.167	6.54	8.250	3.48	11.33	1.94
2.167	2.09	5.250	7.71	8.333	3.48	11.42	1.90
2.250	2.19	5.333	7.71	8.417	3.37	11.50	1.90
2.333	2.19	5.417	9.18	8.500	3.37	11.58	1.86
2.417	2.34	5.500	9.18	8.583	3.26	11.67	1.86
2.500	2.34	5.583	10.65	8.667	3.26	11.75	1.82
2.583	2.50	5.667	10.65	8.750	3.14	11.83	1.82
2.667	2.50	5.750	31.85	8.833	3.14	11.92	1.78
2.750	2.67	5.833	31.85	8.917	3.03	12.00	1.78
2.833	2.67	5.917	79.13	9.000	3.03	12.08	1.74
2.917	2.82	6.000	79.14	9.083	2.93	12.17	1.74
3.000	2.82	6.083	106.99	9.167	2.93		
3.083	2.97	6.167	106.99	9.250	2.81		

Max.Eff.Inten.(mm/hr)=	106.99	41.82
over (min)	5.00	10.00
Storage Coeff. (min)=	2.47 (ii)	5.45 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.29	0.16

TOTALS

PEAK FLOW (cms)=	0.22	0.20	0.413 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	79.40	23.85	37.74
TOTAL RAINFALL (mm)=	80.40	80.40	80.40
RUNOFF COEFFICIENT =	0.99	0.30	0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0027)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0016):   13.44   0.910   6.25   35.20
+ ID2= 2 ( 0024):   2.93   0.413   6.17   37.74
=====
ID = 3 ( 0027):   16.37   1.226   6.17   35.66

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:05 50yr 12hr 10min SCS Type II **

| CALIB |
| NASHYD (0025) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.21

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	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95

3.000 3.16 | 6.083 119.76 | 9.167 3.28 |
3.083 3.33 | 6.167 119.76 | 9.250 3.14 |

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.038 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 29.157
TOTAL RAINFALL (mm)= 90.000
RUNOFF COEFFICIENT = 0.324

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

| CALIB |
| STANDHYD (0018) | Area (ha)= 0.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	68.51	50.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30

1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Max.Eff.Inten.(mm/hr)= 119.76 46.29
over (min) 5.00 15.00
Storage Coeff. (min)= 1.54 (ii) 12.52 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.33 0.08

TOTALS

PEAK FLOW (cms)= 0.04 0.05 0.076 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 89.00 29.77 38.65
TOTAL RAINFALL (mm)= 90.00 90.00 90.00
RUNOFF COEFFICIENT = 0.99 0.33 0.43

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0020) |
1 + 2 = 3
ID1= 1 (0018): 0.70 0.076 6.17 38.65
+ ID2= 2 (0025): 0.47 0.038 6.25 29.16

=====

ID = 3 (0020): 1.17 0.110 6.17 34.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0023) | Area (ha)= 0.31 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.16

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	0.00	3.167	3.33	6.250	19.31	9.333	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99

2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.028 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 29.072
TOTAL RAINFALL (mm)= 90.000
RUNOFF COEFFICIENT = 0.323

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

CALIB			
STANDHYD (0010)	Area (ha)= 11.72		
ID= 1 DT= 5.0 min	Total Imp(%)= 28.00	Dir. Conn.(%)= 21.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	8.44
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	279.49	90.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35

1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Max.Eff.Inten.(mm/hr)= 119.76 45.80
over (min) 5.00 20.00
Storage Coeff. (min)= 3.58 (ii) 15.50 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.26 0.07

TOTALS

PEAK FLOW (cms)= 0.80 0.65 1.265 (iii)
TIME TO PEAK (hrs)= 6.17 6.33 6.17
RUNOFF VOLUME (mm)= 89.00 29.64 42.10
TOTAL RAINFALL (mm)= 90.00 90.00 90.00
RUNOFF COEFFICIENT = 0.99 0.33 0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0022)	Area (ha)= 1.06		
ID= 1 DT= 5.0 min	Total Imp(%)= 23.00	Dir. Conn.(%)= 15.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 84.06 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44
1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Max.Eff.Inten.(mm/hr)= 119.76 53.73

over (min) 5.00 15.00
Storage Coeff. (min)= 1.74 (ii) 10.79 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.32 0.09

TOTALS

PEAK FLOW (cms)= 0.05 0.08 0.118 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 89.00 29.77 38.65
TOTAL RAINFALL (mm)= 90.00 90.00 90.00
RUNOFF COEFFICIENT = 0.99 0.33 0.43

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0014) |
1 + 2 = 3
ID1= 1 (0010): 11.72 1.265 6.17 42.10
+ ID2= 2 (0022): 1.06 0.118 6.17 38.65
=====

ID = 3 (0014): 12.78 1.383 6.17 41.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0014) |
3 + 2 = 1
ID1= 3 (0014): 12.78 1.383 6.17 41.82
+ ID2= 2 (0023): 0.31 0.028 6.17 29.07
=====

ID = 1 (0014): 13.08 1.412 6.17 41.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0021) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
| OUTFLOW STORAGE | OUTFLOW STORAGE

	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.1118	0.0844
	0.0019	0.0096	0.2872	0.0962
	0.0062	0.0195	0.5139	0.1082
	0.0088	0.0296	0.7822	0.1206
	0.0108	0.0400	1.0863	0.1332
	0.0124	0.0507	1.4223	0.1461
	0.0139	0.0616	1.7876	0.1592
	0.0152	0.0729	2.1799	0.1725
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0014)	13.082	1.412	6.17	41.52
OUTFLOW: ID= 1 (0021)	13.082	1.097	6.25	41.42
PEAK FLOW REDUCTION [Qout/Qin](%)=	77.70			
TIME SHIFT OF PEAK FLOW (min)=	5.00			
MAXIMUM STORAGE USED (ha.m.)=	0.1352			

CALIB	
STANDHYD (0017)	Area (ha)= 0.36
ID= 1 DT= 5.0 min	Total Imp(%)= 25.00 Dir. Conn.(%)= 18.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.27
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	48.83	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.33	6.250	19.31	9.33	3.14
0.167	0.00	3.250	3.42	6.333	19.31	9.42	3.02
0.250	1.95	3.333	3.42	6.417	15.41	9.50	3.02
0.333	1.95	3.417	3.42	6.500	15.41	9.58	2.90
0.417	1.98	3.500	3.42	6.583	11.51	9.67	2.90
0.500	1.98	3.583	3.42	6.667	11.51	9.75	2.77
0.583	2.01	3.667	3.42	6.750	8.81	9.83	2.77
0.667	2.01	3.750	3.58	6.833	8.81	9.92	2.65
0.750	2.05	3.833	3.58	6.917	7.92	10.00	2.65
0.833	2.05	3.917	3.85	7.000	7.92	10.08	2.53
0.917	2.09	4.000	3.85	7.083	7.03	10.17	2.53
1.000	2.09	4.083	4.13	7.167	7.03	10.25	2.44

1.083	2.12	4.167	4.13	7.250	6.26	10.33	2.44
1.167	2.12	4.250	4.51	7.333	6.26	10.42	2.39
1.250	2.16	4.333	4.51	7.417	5.78	10.50	2.40
1.333	2.16	4.417	4.92	7.500	5.78	10.58	2.35
1.417	2.19	4.500	4.92	7.583	5.30	10.67	2.35
1.500	2.19	4.583	5.33	7.667	5.30	10.75	2.30
1.583	2.23	4.667	5.33	7.750	4.84	10.83	2.30
1.667	2.23	4.750	5.95	7.833	4.84	10.92	2.26
1.750	2.27	4.833	5.95	7.917	4.49	11.00	2.26
1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Max.Eff.Inten.(mm/hr)=	119.76	52.84	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.26 (ii)	4.59 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.23	
			TOTALS
PEAK FLOW (cms)=	0.02	0.04	0.060 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	89.00	29.56	40.26
TOTAL RAINFALL (mm)=	90.00	90.00	90.00
RUNOFF COEFFICIENT =	0.99	0.33	0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. 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 ( 0016)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0017):   0.36   0.060   6.17   40.26
+ ID2= 2 ( 0021):  13.08   1.097   6.25   41.42
=====
ID = 3 ( 0016):   13.44   1.118   6.25   41.39

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| CALIB
| STANDHYD ( 0024)|
| ID= 1 DT= 5.0 min |
-----
          Area   (ha)=   2.93
          Total Imp(%)= 30.00   Dir. Conn.(%)= 25.00

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

-----
          TIME RAIN   TIME RAIN   TIME RAIN   TIME RAIN
          hrs mm/hr   hrs mm/hr   hrs mm/hr   hrs mm/hr
0.083  0.00  3.167  3.33  6.250  19.31  9.33  3.14
0.167  0.00  3.250  3.42  6.333  19.31  9.42  3.02
0.250  1.95  3.333  3.42  6.417  15.41  9.50  3.02
0.333  1.95  3.417  3.42  6.500  15.41  9.58  2.90
0.417  1.98  3.500  3.42  6.583  11.51  9.67  2.90
0.500  1.98  3.583  3.42  6.667  11.51  9.75  2.77
0.583  2.01  3.667  3.42  6.750  8.81  9.83  2.77
0.667  2.01  3.750  3.58  6.833  8.81  9.92  2.65
0.750  2.05  3.833  3.58  6.917  7.92  10.00  2.65
0.833  2.05  3.917  3.85  7.000  7.92  10.08  2.53
0.917  2.09  4.000  3.85  7.083  7.03  10.17  2.53
1.000  2.09  4.083  4.13  7.167  7.03  10.25  2.44
1.083  2.12  4.167  4.13  7.250  6.26  10.33  2.44
1.167  2.12  4.250  4.51  7.333  6.26  10.42  2.39
1.250  2.16  4.333  4.51  7.417  5.78  10.50  2.40
1.333  2.16  4.417  4.92  7.500  5.78  10.58  2.35
1.417  2.19  4.500  4.92  7.583  5.30  10.67  2.35
1.500  2.19  4.583  5.33  7.667  5.30  10.75  2.30
1.583  2.23  4.667  5.33  7.750  4.84  10.83  2.30
1.667  2.23  4.750  5.95  7.833  4.84  10.92  2.26
1.750  2.27  4.833  5.95  7.917  4.49  11.00  2.26

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1.833	2.27	4.917	6.63	8.000	4.49	11.08	2.22
1.917	2.30	5.000	6.63	8.083	4.15	11.17	2.22
2.000	2.30	5.083	7.32	8.167	4.15	11.25	2.17
2.083	2.34	5.167	7.32	8.250	3.89	11.33	2.17
2.167	2.34	5.250	8.63	8.333	3.89	11.42	2.13
2.250	2.45	5.333	8.63	8.417	3.77	11.50	2.13
2.333	2.45	5.417	10.27	8.500	3.77	11.58	2.08
2.417	2.62	5.500	10.27	8.583	3.65	11.67	2.08
2.500	2.62	5.583	11.92	8.667	3.65	11.75	2.04
2.583	2.79	5.667	11.92	8.750	3.52	11.83	2.04
2.667	2.79	5.750	35.65	8.833	3.52	11.92	1.99
2.750	2.99	5.833	35.65	8.917	3.40	12.00	1.99
2.833	2.99	5.917	88.58	9.000	3.40	12.08	1.95
2.917	3.16	6.000	88.58	9.083	3.28	12.17	1.95
3.000	3.16	6.083	119.76	9.167	3.28		
3.083	3.33	6.167	119.76	9.250	3.14		

Max.Eff.Inten.(mm/hr)=	119.76	51.01
over (min)	5.00	10.00
Storage Coeff. (min)=	2.36 (ii)	5.21 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.30	0.16

TOTALS

PEAK FLOW (cms)=	0.24	0.24	0.486 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	89.00	29.12	44.09
TOTAL RAINFALL (mm)=	90.00	90.00	90.00
RUNOFF COEFFICIENT =	0.99	0.32	0.49

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD ( 0027)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0016):   13.44   1.118   6.25   41.39
+ ID2= 2 ( 0024):   2.93   0.486   6.17   44.09
=====
ID = 3 ( 0027):   16.37   1.522   6.17   41.87

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:06 100yr 12hr 10min SCS Type II **

| CALIB |
| NASHYD (0025) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.21

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	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13

3.000 3.45 | 6.083 130.94 | 9.167 3.58 |
3.083 3.64 | 6.167 130.94 | 9.250 3.44 |

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.044 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 34.049
TOTAL RAINFALL (mm)= 98.400
RUNOFF COEFFICIENT = 0.346

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

| CALIB |
| STANDHYD (0018) | Area (ha)= 0.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	68.51	50.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52

1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Max.Eff.Inten.(mm/hr)= 130.94 62.62
over (min) 5.00 15.00
Storage Coeff. (min)= 1.48 (ii) 11.22 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.33 0.09

TOTALS

PEAK FLOW (cms)= 0.04 0.06 0.089 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 97.40 34.72 44.12
TOTAL RAINFALL (mm)= 98.40 98.40 98.40
RUNOFF COEFFICIENT = 0.99 0.35 0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0018):	0.70	0.089	6.17	44.12
+ ID2= 2 (0025):	0.47	0.044	6.25	34.05

=====

ID = 3 (0020): 1.17 0.128 6.17 40.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	0.31	Curve Number (CN)=	61.0
NASHYD (0023)	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp(hrs)=	0.16		

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	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18

2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 33.949
TOTAL RAINFALL (mm)= 98.400
RUNOFF COEFFICIENT = 0.345

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

CALIB			
STANDHYD (0010)	Area (ha)= 11.72		
ID= 1 DT= 5.0 min	Total Imp(%)= 28.00	Dir. Conn.(%)= 21.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	8.44
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	5.00
Length (m)=	279.49	90.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57

1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Max.Eff.Inten.(mm/hr)= 130.94 53.50
over (min) 5.00 15.00
Storage Coeff. (min)= 3.45 (ii) 14.65 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.26 0.08

TOTALS

PEAK FLOW (cms)= 0.88 0.81 1.561 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 97.40 34.57 47.77
TOTAL RAINFALL (mm)= 98.40 98.40 98.40
RUNOFF COEFFICIENT = 0.99 0.35 0.49

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0022)	Area (ha)= 1.06		
ID= 1 DT= 5.0 min	Total Imp(%)= 23.00	Dir. Conn.(%)= 15.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 84.06 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67
1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Max.Eff.Inten.(mm/hr)= 130.94 62.62

over (min) 5.00 15.00
Storage Coeff. (min)= 1.68 (ii) 10.19 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.32 0.09

TOTALS

PEAK FLOW (cms)= 0.06 0.09 0.136 (iii)
TIME TO PEAK (hrs)= 6.17 6.25 6.17
RUNOFF VOLUME (mm)= 97.40 34.72 44.12
TOTAL RAINFALL (mm)= 98.40 98.40 98.40
RUNOFF COEFFICIENT = 0.99 0.35 0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0014) |
1 + 2 = 3
ID1= 1 (0010): 11.72 1.561 6.17 47.77
+ ID2= 2 (0022): 1.06 0.136 6.17 44.12
=====

ID = 3 (0014): 12.78 1.697 6.17 47.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0014) |
3 + 2 = 1
ID1= 3 (0014): 12.78 1.697 6.17 47.46
+ ID2= 2 (0023): 0.31 0.033 6.17 33.95
=====

ID = 1 (0014): 13.08 1.730 6.17 47.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0021) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
| OUTFLOW STORAGE | OUTFLOW STORAGE

	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.1118	0.0844
	0.0019	0.0096	0.2872	0.0962
	0.0062	0.0195	0.5139	0.1082
	0.0088	0.0296	0.7822	0.1206
	0.0108	0.0400	1.0863	0.1332
	0.0124	0.0507	1.4223	0.1461
	0.0139	0.0616	1.7876	0.1592
	0.0152	0.0729	2.1799	0.1725

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0014)	13.082	1.730	6.17	47.15
OUTFLOW: ID= 1 (0021)	13.082	1.392	6.25	47.05

PEAK FLOW REDUCTION [Qout/Qin](%)= 80.44
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.1469

CALIB			
STANDHYD (0017)	Area (ha)= 0.36		
ID= 1 DT= 5.0 min	Total Imp(%)= 25.00	Dir. Conn.(%)= 18.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.09	0.27
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	48.83	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.64	6.250	21.12	9.33	3.44
0.167	0.00	3.250	3.74	6.333	21.12	9.42	3.31
0.250	2.13	3.333	3.74	6.417	16.85	9.50	3.31
0.333	2.13	3.417	3.74	6.500	16.85	9.58	3.18
0.417	2.16	3.500	3.74	6.583	12.58	9.67	3.18
0.500	2.16	3.583	3.74	6.667	12.58	9.75	3.03
0.583	2.20	3.667	3.74	6.750	9.63	9.83	3.03
0.667	2.20	3.750	3.91	6.833	9.63	9.92	2.89
0.750	2.24	3.833	3.91	6.917	8.66	10.00	2.89
0.833	2.24	3.917	4.21	7.000	8.66	10.08	2.76
0.917	2.28	4.000	4.21	7.083	7.68	10.17	2.76
1.000	2.28	4.083	4.51	7.167	7.68	10.25	2.67

1.083	2.32	4.167	4.51	7.250	6.84	10.33	2.67
1.167	2.32	4.250	4.93	7.333	6.84	10.42	2.62
1.250	2.36	4.333	4.93	7.417	6.32	10.50	2.62
1.333	2.36	4.417	5.38	7.500	6.32	10.58	2.57
1.417	2.40	4.500	5.38	7.583	5.79	10.67	2.57
1.500	2.40	4.583	5.83	7.667	5.79	10.75	2.52
1.583	2.44	4.667	5.83	7.750	5.29	10.83	2.52
1.667	2.44	4.750	6.51	7.833	5.29	10.92	2.47
1.750	2.48	4.833	6.51	7.917	4.91	11.00	2.47
1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

Max.Eff.Inten.(mm/hr)=	130.94	61.60
over (min)	5.00	5.00
Storage Coeff. (min)=	1.21 (ii)	4.43 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.33	0.23

TOTALS

PEAK FLOW (cms)=	0.02	0.05	0.068 (iii)
TIME TO PEAK (hrs)=	6.17	6.17	6.17
RUNOFF VOLUME (mm)=	97.40	34.49	45.81
TOTAL RAINFALL (mm)=	98.40	98.40	98.40
RUNOFF COEFFICIENT =	0.99	0.35	0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD ( 0016)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0017):   0.36   0.068   6.17   45.81
+ ID2= 2 ( 0021):  13.08   1.392   6.25   47.05
=====
ID = 3 ( 0016):   13.44   1.416   6.25   47.02

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| STANDHYD ( 0024)|
| ID= 1 DT= 5.0 min|
-----
          Area   (ha)=   2.93
          Total Imp(%)= 30.00   Dir. Conn.(%)= 25.00

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	2.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	139.88	5.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

-----
          TIME RAIN   TIME RAIN   TIME RAIN   TIME RAIN
          hrs mm/hr   hrs mm/hr   hrs mm/hr   hrs mm/hr
0.083 0.00 3.167 3.64 6.250 21.12 9.33 3.44
0.167 0.00 3.250 3.74 6.333 21.12 9.42 3.31
0.250 2.13 3.333 3.74 6.417 16.85 9.50 3.31
0.333 2.13 3.417 3.74 6.500 16.85 9.58 3.18
0.417 2.16 3.500 3.74 6.583 12.58 9.67 3.18
0.500 2.16 3.583 3.74 6.667 12.58 9.75 3.03
0.583 2.20 3.667 3.74 6.750 9.63 9.83 3.03
0.667 2.20 3.750 3.91 6.833 9.63 9.92 2.89
0.750 2.24 3.833 3.91 6.917 8.66 10.00 2.89
0.833 2.24 3.917 4.21 7.000 8.66 10.08 2.76
0.917 2.28 4.000 4.21 7.083 7.68 10.17 2.76
1.000 2.28 4.083 4.51 7.167 7.68 10.25 2.67
1.083 2.32 4.167 4.51 7.250 6.84 10.33 2.67
1.167 2.32 4.250 4.93 7.333 6.84 10.42 2.62
1.250 2.36 4.333 4.93 7.417 6.32 10.50 2.62
1.333 2.36 4.417 5.38 7.500 6.32 10.58 2.57
1.417 2.40 4.500 5.38 7.583 5.79 10.67 2.57
1.500 2.40 4.583 5.83 7.667 5.79 10.75 2.52
1.583 2.44 4.667 5.83 7.750 5.29 10.83 2.52
1.667 2.44 4.750 6.51 7.833 5.29 10.92 2.47
1.750 2.48 4.833 6.51 7.917 4.91 11.00 2.47

```

1.833	2.48	4.917	7.25	8.000	4.91	11.08	2.42
1.917	2.52	5.000	7.25	8.083	4.54	11.17	2.42
2.000	2.52	5.083	8.00	8.167	4.54	11.25	2.37
2.083	2.55	5.167	8.00	8.250	4.26	11.33	2.37
2.167	2.55	5.250	9.44	8.333	4.26	11.42	2.33
2.250	2.68	5.333	9.44	8.417	4.13	11.50	2.33
2.333	2.68	5.417	11.23	8.500	4.13	11.58	2.28
2.417	2.87	5.500	11.23	8.583	3.99	11.67	2.28
2.500	2.87	5.583	13.03	8.667	3.99	11.75	2.23
2.583	3.05	5.667	13.03	8.750	3.84	11.83	2.23
2.667	3.05	5.750	38.98	8.833	3.84	11.92	2.18
2.750	3.26	5.833	38.98	8.917	3.71	12.00	2.18
2.833	3.26	5.917	96.85	9.000	3.71	12.08	2.13
2.917	3.45	6.000	96.85	9.083	3.58	12.17	2.13
3.000	3.45	6.083	130.94	9.167	3.58		
3.083	3.64	6.167	130.94	9.250	3.44		

```

Max.Eff.Inten.(mm/hr)= 130.94   59.51
over (min)             5.00   10.00
Storage Coeff. (min)= 2.28 (ii) 5.03 (ii)
Unit Hyd. Tpeak (min)= 5.00   10.00
Unit Hyd. peak (cms)= 0.30   0.16

```

TOTALS

```

PEAK FLOW (cms)= 0.27   0.29   0.553 (iii)
TIME TO PEAK (hrs)= 6.17   6.17   6.17
RUNOFF VOLUME (mm)= 97.40  33.99  49.84
TOTAL RAINFALL (mm)= 98.40  98.40  98.40
RUNOFF COEFFICIENT = 0.99   0.35   0.51

```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD ( 0027)|
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0016):   13.44   1.416   6.25   47.02
+ ID2= 2 ( 0024):   2.93   0.553   6.17   49.84
=====
ID = 3 ( 0027):   16.37   1.877   6.17   47.52

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:07 25mm CHI **

| CALIB |
| NASHYD (0025) | Area (ha)= 0.47 Curve Number (CN)= 61.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.21

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	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Unit Hyd Qpeak (cms)= 0.085

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 2.169
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.087

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

| CALIB |
| STANDHYD (0018) | Area (ha)= 0.70
| ID= 1 DT= 5.0 min | Total Imp(%)= 23.00 Dir. Conn.(%)= 15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.16	0.54
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	68.51	50.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Max.Eff.Inten.(mm/hr)= 57.66 2.10
over (min) 5.00 40.00
Storage Coeff. (min)= 2.06 (ii) 39.88 (ii)
Unit Hyd. Tpeak (min)= 5.00 40.00
Unit Hyd. peak (cms)= 0.31 0.03

TOTALS

PEAK FLOW (cms)= 0.02 0.00 0.017 (iii)
TIME TO PEAK (hrs)= 1.33 2.08 1.33
RUNOFF VOLUME (mm)= 23.91 2.30 5.51
TOTAL RAINFALL (mm)= 24.91 24.91 24.91
RUNOFF COEFFICIENT = 0.96 0.09 0.22

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0020) |
1 + 2 = 3
ID1= 1 (0018): 0.70 0.017 1.33 5.51
+ ID2= 2 (0025): 0.47 0.002 1.58 2.17

=====

ID = 3 (0020): 1.17 0.018 1.33 4.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0023)	Area (ha)=	0.31	Curve Number (CN)=	61.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.16		

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	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Unit Hyd Qpeak (cms)= 0.073

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 2.162
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.087

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

CALIB				
STANDHYD (0010)	Area (ha)=	11.72		
ID= 1 DT= 5.0 min	Total Imp(%)=	28.00	Dir. Conn.(%)=	21.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.28	8.44
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	2.00	5.00

Length (m)= 279.49 90.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Max.Eff.Inten.(mm/hr)= 57.66 1.93
over (min) 5.00 50.00
Storage Coeff. (min)= 4.79 (ii) 47.06 (ii)
Unit Hyd. Tpeak (min)= 5.00 50.00
Unit Hyd. peak (cms)= 0.22 0.02

TOTALS

PEAK FLOW (cms)= 0.35 0.02 0.356 (iii)
TIME TO PEAK (hrs)= 1.33 2.25 1.33
RUNOFF VOLUME (mm)= 23.91 2.29 6.82
TOTAL RAINFALL (mm)= 24.91 24.91 24.91
RUNOFF COEFFICIENT = 0.96 0.09 0.27

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0022)	Area (ha)=	1.06		
ID= 1 DT= 5.0 min	Total Imp(%)=	23.00	Dir. Conn.(%)=	15.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.24	0.82

Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 84.06 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Max.Eff.Inten.(mm/hr)= 57.66 2.25
over (min) 5.00 35.00
Storage Coeff. (min)= 2.33 (ii) 34.51 (ii)
Unit Hyd. Tpeak (min)= 5.00 35.00
Unit Hyd. peak (cms)= 0.30 0.03

TOTALS

PEAK FLOW (cms)= 0.03 0.00 0.025 (iii)
TIME TO PEAK (hrs)= 1.33 2.00 1.33
RUNOFF VOLUME (mm)= 23.91 2.30 5.52
TOTAL RAINFALL (mm)= 24.91 24.91 24.91
RUNOFF COEFFICIENT = 0.96 0.09 0.22

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	11.72	0.356	1.33	6.82
+ ID2= 2 (0022):	1.06	0.025	1.33	5.52
=====				
ID = 3 (0014):	12.78	0.382	1.33	6.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0014):	12.78	0.382	1.33	6.72
+ ID2= 2 (0023):	0.31	0.002	1.50	2.16
=====				
ID = 1 (0014):	13.08	0.383	1.33	6.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0021)	OVERFLOW IS OFF			
IN= 2---> OUT= 1	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
DT= 5.0 min	0.0000	0.0000	0.1118	0.0844
	0.0019	0.0096	0.2872	0.0962
	0.0062	0.0195	0.5139	0.1082
	0.0088	0.0296	0.7822	0.1206
	0.0108	0.0400	1.0863	0.1332
	0.0124	0.0507	1.4223	0.1461
	0.0139	0.0616	1.7876	0.1592
	0.0152	0.0729	2.1799	0.1725

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0014)	13.082	0.383	1.33	6.61
OUTFLOW: ID= 1 (0021)	13.082	0.015	4.17	6.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.84
TIME SHIFT OF PEAK FLOW (min)=170.00
MAXIMUM STORAGE USED (ha.m.)= 0.0682

CALIB	Area (ha)=	0.36
STANDHYD (0017)	Total Imp(%)=	25.00 Dir. Conn.(%)= 18.00

| ADD HYD (0014)|

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.09	0.27
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	48.83	5.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Max.Eff.Inten.(mm/hr)=	57.66	3.79
over (min)	5.00	10.00
Storage Coeff. (min)=	1.68 (ii)	6.15 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.32	0.15
TOTALS		
PEAK FLOW (cms)=	0.01	0.00
TIME TO PEAK (hrs)=	1.33	1.42
RUNOFF VOLUME (mm)=	23.91	2.27
TOTAL RAINFALL (mm)=	24.91	24.91
RUNOFF COEFFICIENT =	0.96	0.09
		0.25

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0016)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0017):	0.36	0.012	1.33	6.15
+ ID2= 2 (0021):	13.08	0.015	4.17	6.51
=====				
ID = 3 (0016):	13.44	0.019	1.33	6.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0024)			
ID= 1 DT= 5.0 min			

Area (ha)=	2.93		
Total Imp(%)=	30.00	Dir. Conn.(%)=	25.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.88	2.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	139.88	5.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.90	2.833	2.42	3.83	1.62
0.917	5.27	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Max.Eff.Inten.(mm/hr)=	57.66	3.58
over (min)	5.00	10.00
Storage Coeff. (min)=	3.16 (ii)	6.98 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.27	0.14
TOTALS		
PEAK FLOW (cms)=	0.11	0.02
TIME TO PEAK (hrs)=	1.33	1.42
		1.33

RUNOFF VOLUME	(mm)=	23.91	2.21	7.64
TOTAL RAINFALL	(mm)=	24.91	24.91	24.91
RUNOFF COEFFICIENT	=	0.96	0.09	0.31

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0027)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0016):	13.44	0.019	1.33	6.50
+ ID2= 2 (0024):	2.93	0.124	1.33	7.64
=====				
ID = 3 (0027):	16.37	0.143	1.33	6.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Appendix E: Water Quality

Water Quality Requirements



Project Name: CR 10 Ida Development Designed By: LM

Project No: 25017

Date: 2025-12-22

Site Data				
Protection Level:	=	Enhanced		
Facility Type:	=	Wet Pond		
Area	=	13.59	ha	
% Impervious Calculated	=	27%	%	
Impervious Area	=	3.67	ha	
Required Extended Detention Volume (Ved)**				
Ved	=	40	m ³ /ha	
	=	544	m ³	
Ved _{25mm}	=	698	m ³	
Total Required Storage Volume (Vs)*				
Vs	=	140	m ³ /ha	*Min for Wet ponds used
	=	1903	m ³	
Required Permanent Pool Volume (Vpp = Vs - Ved)				
Vpp	=	100	m ³ /ha	
	=	1359	m ³	
Permanent Pool Volume Provided	≈	1414	m ³	
Provided Volumes vs. Required Volumes				
Quantity Control Volume Required	=	1484.0	m ³	
Quantity Control Volume Provided	=	1592.0	m ³	
Total Pond Volume Required	=	2843	m ³	
Total Pond Volume Provided	=	3006	m ³	

*Required volumes calculated utilizing quadratic regression ($y = Ax^2 + Bx + C$) including an A value of -120.57, B value of 366.31 and C value of 26.24 based on the below table.

**Extended Detention is required only for wet facilities and based on the MOE requirement of 40m³/ha

Notes:

Table 3.2: Water Quality Storage Requirements based on Receiving Waters (MOE SWMPD Manual)

Protection Level	SWMP Type	Storage Volume (m ³ /ha) for Impervious Level				
		0%	35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	16.25	25	30	35	40
	Wetlands	36.25	80	105	120	140
	Hybrid Wet Pond/Wetland	40	110	150	175	195
	Wet Pond	52.5	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	20	25	30
	Wetlands	42.5	60	70	80	90
	Hybrid Wet Pond/Wetland	48.75	75	90	105	120
	Wet Pond	55	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20	20
	Wetlands	60	60	60	60	60
	Hybrid Wet Pond/Wetland	42.5	60	70	75	80
	Wet Pond	33.75	60	75	85	95
	Dry Pond (Continuous Flow)	0	90	150	200	240

Drawdown Time Calculations

Design Sheet



Project Name: CR10 Ida Development

Project No: 25017

Designed By: LM

Date: 2025-12-22

Design Criteria			Design Storms	
Quality Volume: ¹	40	m ³ /ha	Volume:	Chicago 25 mm
Disturbed Area:	12.227	ha	Conveyance:	100-Year
Volume Required:	489	m ³		
Peak Flow Calculations				
Chicago 25 mm:	0.383	m ³ /s		
100-Year:	1.777	m ³ /s		
Storage Volume				
Req'd Quality Volume:	489	m ³		
Req'd Volume (Chicago 25 mm):	698	m ³		
Volume Provided:	729	m ³		
Drawdown Time Calculation				
Head vs. Surface Area				
Outlet Configuration			Drawdown Time ²	
Outlet Type:	Orifice		$t = (0.66C_1h^{1.5} + 2C_2h^{0.5})/2.75A$	
Diameter:	100	mm	where	
Invert:	255.70	mm	$C_1 = 1071$ slope coefficient (from regression)	
Peak Discharge: ³	0.015	m ³ /s	$C_2 = 1900$ intercept (from regression)	
			$h = 0.350$ maximum water elevation (m)	
			$A = 0.008$ cross sect. area orifice (m ²)	
			$t = 110863.4$ seconds	
			$= 30.795$ hours	

Notes:

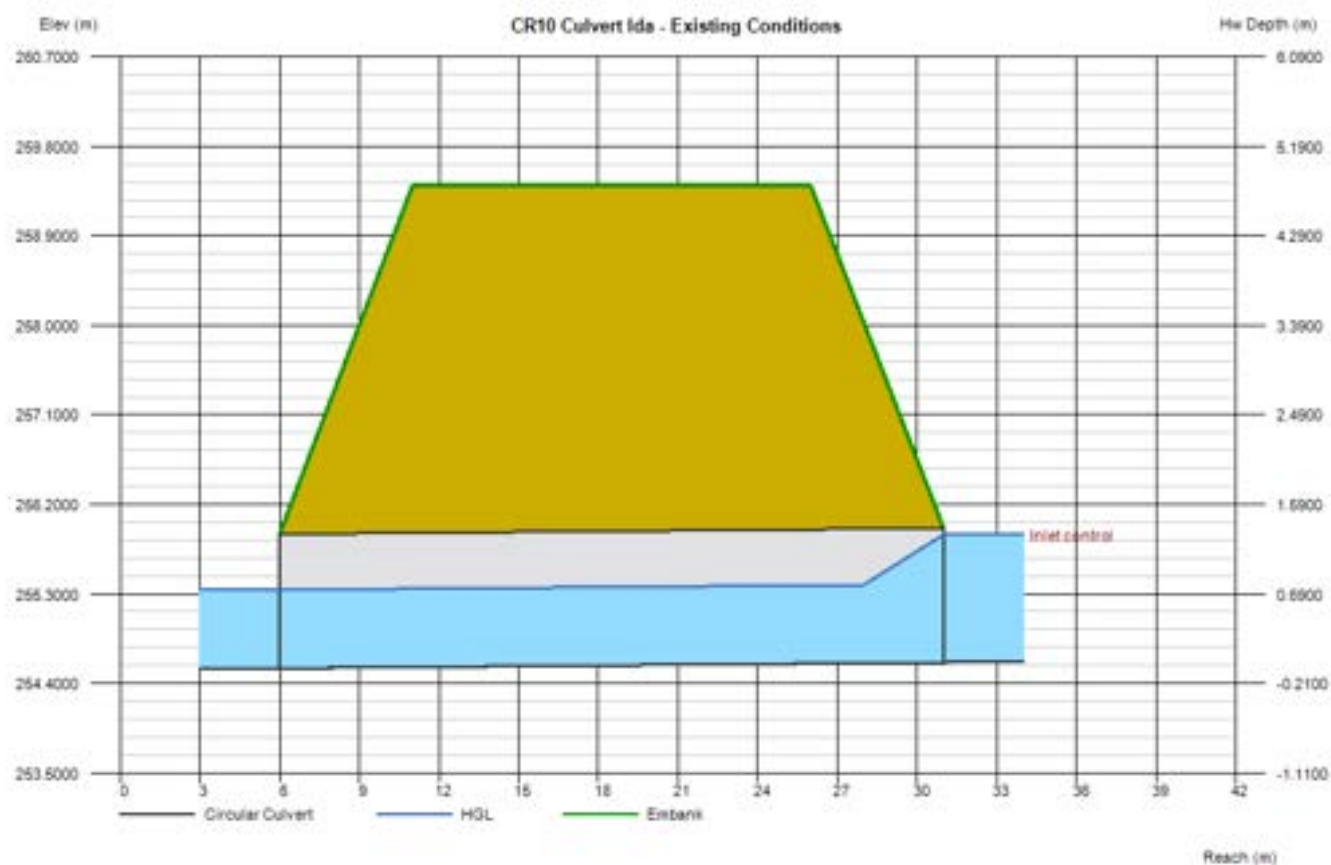
- From ESC Design Guidelines for Urban Construction, GGHCA
- From MOE SWMPDM Section 4.6.
- Orifice Tube discharge calculated according to $Q=0.80A(2gh)^{1/2}$

Appendix F: Conveyance

Culvert Report

CR10 Culvert Ida - Existing Conditions

Invert Elev Dn (m)	= 254.5500	Calculations	
Pipe Length (m)	= 25.0000	Qmin (cms)	= 0.0000
Slope (%)	= 0.2400	Qmax (cms)	= 2.2030
Invert Elev Up (m)	= 254.6100	Tailwater Elev (m)	= 0.00
Rise (mm)	= 1350.0		
Shape	= Circular	Highlighted	
Span (mm)	= 1350.0	Qtotal (cms)	= 2.2030
No. Barrels	= 1	Qpipe (cms)	= 2.2030
n-Value	= 0.012	Qovertop (cms)	= 0.0000
Culvert Type	= Circular Corrugate Metal Pipe	Veloc Dn (m/s)	= 2.5356
Culvert Entrance	= Projecting	Veloc Up (m/s)	= 2.5356
Coeff. K,M,c,Y,k	= 0.034, 1.5, 0.0553, 0.54, 0.9	HGL Dn (m)	= 255.3390
		HGL Up (m)	= 255.3990
		Hw Elev (m)	= 255.8959
		Hw/D (m)	= 0.9525
		Flow Regime	= Inlet Control
Embankment			
Top Elevation (m)	= 259.4000		
Top Width (m)	= 15.0000		
Crest Width (m)	= 20.0000		



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Monday, Jan 12 2026

CR10 Culvert Ida - Proposed Conditions

Invert Elev Dn (m)	= 254.5500
Pipe Length (m)	= 25.0000
Slope (%)	= 0.2400
Invert Elev Up (m)	= 254.6100
Rise (mm)	= 1350.0
Shape	= Circular
Span (mm)	= 1350.0
No. Barrels	= 1
n-Value	= 0.012
Culvert Type	= Circular Corrugate Metal Pipe
Culvert Entrance	= Projecting
Coeff. K,M,c,Y,k	= 0.034, 1.5, 0.0553, 0.54, 0.9

Embankment

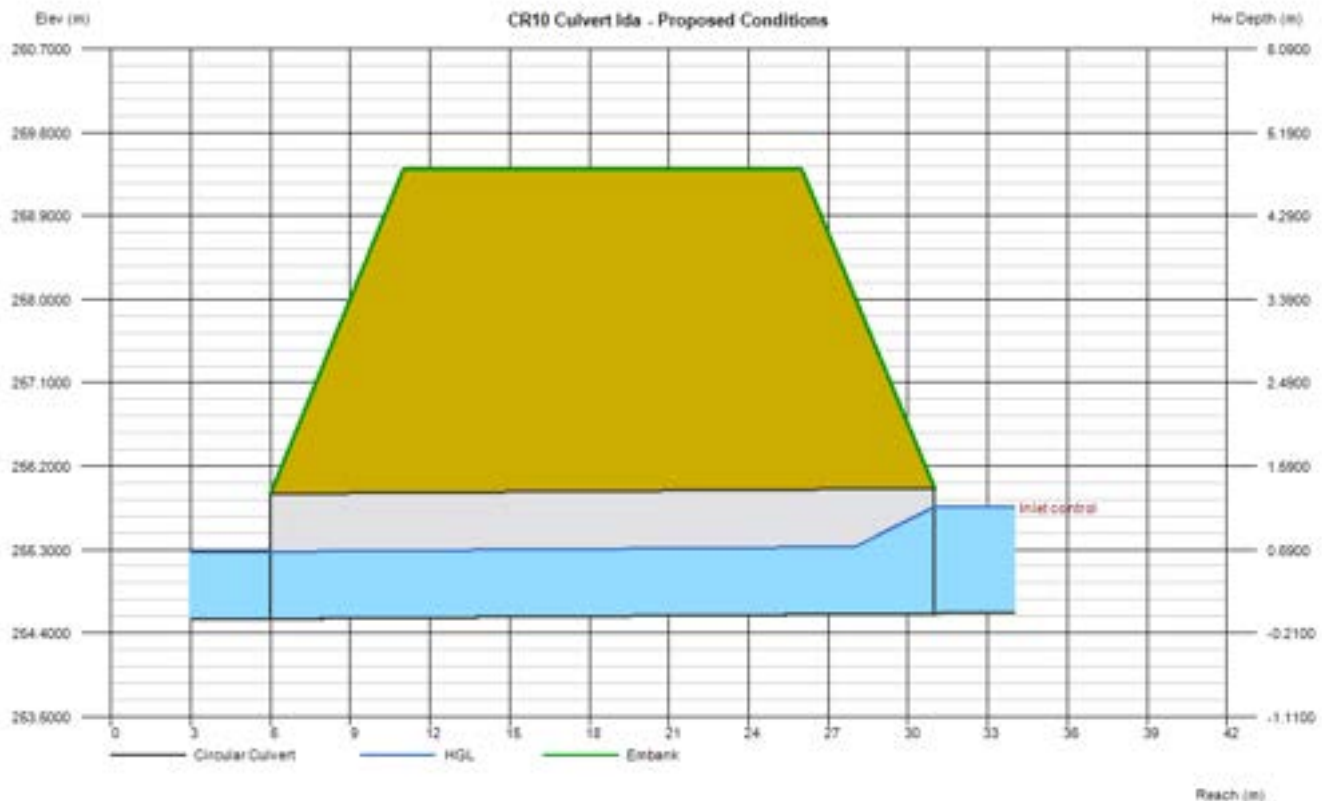
Top Elevation (m)	= 259.4000
Top Width (m)	= 15.0000
Crest Width (m)	= 20.0000

Calculations

Qmin (cms)	= 0.0000
Qmax (cms)	= 1.8770
Tailwater Elev (m)	= 0.00

Highlighted

Qtotat (cms)	= 1.8770
Qpipe (cms)	= 1.8770
Qovertop (cms)	= 0.0000
Veloc Dn (m/s)	= 2.3939
Veloc Up (m/s)	= 2.3939
HGL Dn (m)	= 255.2757
HGL Up (m)	= 255.3357
Hw Elev (m)	= 255.7606
Hw/D (m)	= 0.8523
Flow Regime	= Inlet Control



Channel Design Sheet



Project Name: CR 10 Ida Development

Project No: 25017

Designed By: LM

Date: 2026-01-12

Channel Description	Peak Flows (m ³ /s)	Bed Slope (%)	Side Slope (X : 1)	Bottom Width (m)	Depth (m)	Bottom Elevation (m)	Lining Material	Manning's Number	Cross Sectional Area	Channel Capacity	% Capacity	Flow Depth	Velocity
100 Yr Rear Yard	1.56	1.00%	3.00	0.00	0.8	100.0	Earth, Grass	0.030	1.92 m ²	3.36 m ³ /s	46.5%	0.60 m	1.44 m/s
Typical Roadside Swale	0.78	1.50%	3.00	0.00	0.5	100.0	Earth, Grass	0.030	0.75 m ²	1.17 m ³ /s	66.4%	0.43 m	1.41 m/s

Appendix G: Low Impact Development Sizing Calculations

Soakaway Sizing



Project Name: CR10 Development, Ida

Project No: 25017

Designed By: LM

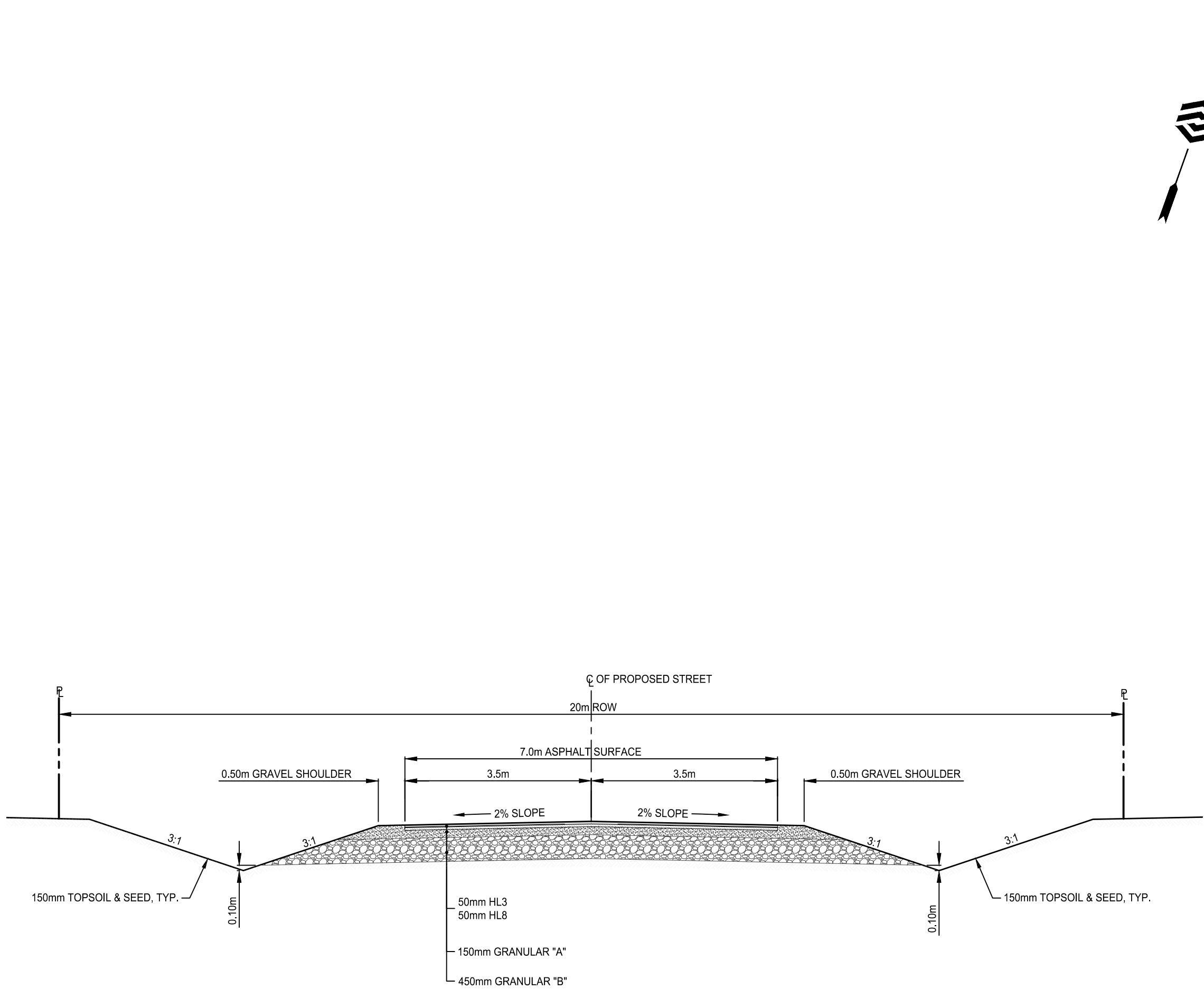
Date: 2026-01-09

Soil Information			
Geotechnical Report prepared by Redstone Engineering Inc. dated June 13, 2025			
Borehole	Soil Characteristics	Percolation Time (min/cm)	Infiltration Rate (mm/hr)
BH1	Till	30-35	20-24
BH3	Till	35-40	18-20
BH5	Till	40-45	15-18
Reservoir Depth - $d_r \max = i \cdot t_s / V_r$			
i = native soil infiltration rate		5	mm/hr
V_r = void space ratio (40% = 0.4)		0.4	
t_s = time to drain		48	hr
$d_r \max$ = max. stone reservoir depth		600	mm

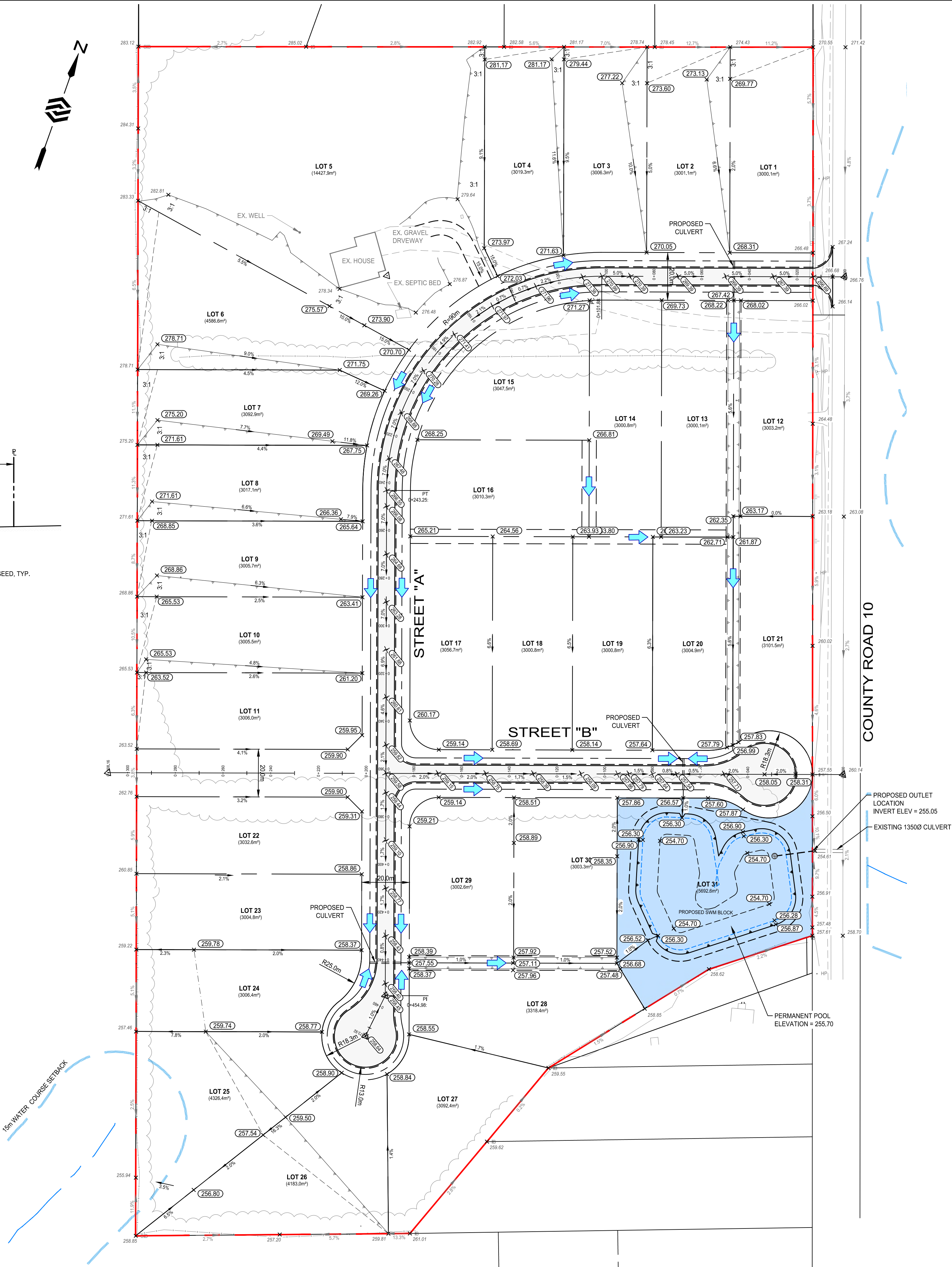
Notes:

1. Calculations taken from CVC Low Impact Development Stormwater Management Planning and Design Guide section 4.5.2

Appendix H: Preliminary Grading Plan



TYPICAL ROAD SECTION
SCALE: 1:75



SURVEY
TOPOGRAPHIC SURVEY PROVIDED
BY ENGAGE ENGINEERING ETC.

BENCHMARK
BENCHMARK DESCRIPTION

ELEV:

NOTES:

PR.	EX.	FEATURE
		EDGE OF PAVEMENT
		BACK OF CURB
		EDGE OF GRAVEL
		CENTRELINE OF ROAD
		DITCH
		SIDEWALK
		FENCE LINE
		RETAINING WALL
		LIGHT DUTY ASPHALT
		HEAVY DUTY ASPHALT
		GRASSLANDSCAPED
		CONC. DRIVEWAY RAMP
		ASPH. DRIVEWAY RAMP
		INTERLOCK BRICK
		GAS MAIN
		OVERHEAD BELL
		UNDERGROUND BELL
		OVERHEAD HYDR.
		UNDERGROUND HYDR.
		STORM SEWER
		SANITARY SEWER
		PROPERTY LINE
		RIGHT-OF-WAY
		LIGHT STANDARD
		MAIL BOX
		ROAD SIGN
		CONFEROUS TREE
		DECIDUOUS TREE

1.	ISSUED FOR REVIEW	SD	2025-01-09
No.	REVISION	BY	DATE



IDA DEVELOPMENT

TOWNSHIP OF CAVAN-MONAGHAN

PRELIMINARY
GRADING PLAN

PETERBOROUGH COUNTY

DRAWN BY: S.DINGMAN	STAMP:
DESIGNED BY: S.DINGMAN	
APPROVED BY:	
DATE: 2025-10-31	
SCALE: 1:1000	
PROJECT NUMBER: 25017	SHEET NAME: GP
	SHEET: 2 of 2

Appendix I: Geotechnical Investigation Report

**GEOTECHNICAL INVESTIGATION REPORT
SUBDIVISION DEVELOPMENT (2ND PHASE)
1812 COUNTY ROAD 10
VILLAGE OF IDA, TOWNSHIP OF CAVAN-MONAGHAN, ONTARIO
REDSTONE PROJECT NO. 25R103**

Prepared for:

Ian Cameron
1812 County Road 10
Cavan, Ontario L0A1C0

June 13, 2025



Redstone Engineering Inc.
171A Rink Street, Suite 143
Peterborough, Ontario K9J 2J6
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**GEOTECHNICAL INVESTIGATION REPORT
SUBDIVISION DEVELOPMENT (2ND PHASE)
1812 COUNTY ROAD 10, VILLAGE OF IDA, TOWNSHIP OF CAVAN-MONAGHAN, ONTARIO
REDSTONE PROJECT NO. 25R103**

1.0 INTRODUCTION

This report presents the results of a geotechnical investigation performed in support of the design and construction of the second phase (Ph2) of a residential subdivision to be located on the west side of Peterborough County Road 10 about 0.5km south of the intersection with Sharpe Line, immediately south of what Redstone understands is this development's first phase (Ph1) that is currently being constructed around a roadway identified as Cameron Court. The current subject site's proposed development is referred to herein as the Ph2 Development.

Redstone Engineering Inc. (Redstone) was retained by Mr. Ian Cameron (the Client) to conduct this geotechnical investigation. This work was carried out in accordance with Redstone's proposal #P1379 dated February 28, 2025, as authorized by Mr. Ian Cameron's March 26, 2025 execution of Redstone's proposal.

The following information was received from Engage Engineering Ltd (Engage) by way of email dated Feb 19, 2025:

- an aerial image showing the approximate outline of the Ph2 Development lands;
- a drawing by JBF Surveyors (JBF) titled "Plan of Survey of Part of Lot 12 Concession 10 Geographic Township of Cavan, Township of Cavan Monaghan, County of Peterborough", dated Nov 28 2014;
- a drawing by EcoLine Design Studio (EDS) titled "Site Plan – 1812 County Road 10, Ida, ON", Sheet No. A0, dated Sep 2024 (referred to herein as the Site Plan);
- a Peterborough County Record of Pre-Consultation dated Nov 25 2024 (herein referred to as the Pre-Consult Letter);
- an Otonabee Region Conservation Authority (ORCA) letter titled "Plan Review Pre-consultation Memo", dated Nov 27 2024; and
- a Peterborough County document titled "Study Requirements for Official Plan Amendments & Subdivision/Condominium Developments", undated.

Based on the information provided, it is Redstone's understanding that the proposed Ph2 Development will consist of constructing residential lots with an associated internal road network per the Site Plan. It is noted that the proposed layout as shown on the Site Plan has been used as the basis for the works performed for this study.

As of the fieldwork performed for this study, the Ph2 Development site contains an entrance and driveway to a house recently-constructed on Lot 4. Beyond this existing house the remainder of the Ph2 Development site is generally undeveloped, consisting of farm fields with some tree lines.

Information regarding the final proposed grading of the Ph2 Development (including road surfaces, service inverts, and house slabs) was not available to Redstone as of writing this report. It is Redstone's assumption that the final road and house grades will closely match the existing grades, that the buildings will be typical 1 or 2 storey residential structures with or without basements, and service inverts will be no deeper than 3m below existing grade (mbeg).

It is Redstone's understanding that the Client has retained Pigeonview Consulting Inc (PV) to conduct a hydrogeological study of the site in support of the proposed Ph2 Development.

2.0 PURPOSE & SCOPE

The purpose of this geotechnical investigation is to obtain subsurface information regarding the soil and groundwater conditions within the boreholes, and based on these findings, provide geotechnical engineering recommendations for design (including commentary regarding construction only as it may impact design of the Ph2 Development) for earthworks and ground preparations, general construction dewatering (hydrogeological details and reporting by others), bearing capacity for building foundations and slabs, retaining and basement walls, site servicing, and roads including pavement structure. Redstone's scope does not include any life-cycle costing, chemical or geochemical testing, excess soil works, hydrogeological work, EASR or PTTW, or environmental assessments.

The following scope of work was performed as part of this investigation.

1. The boreholes were laid out onsite as shown on the Borehole Location Plan (Figure 1).
2. Underground services were cleared prior to advancing the boreholes. While this investigation cleared underground utilities from the area of each borehole, it did not confirm the presence or location of all utilities / services at all areas or for the purpose of the project's design or construction.
3. The subsurface soil and groundwater conditions were explored by advancing, sampling and logging a total of seven (7) boreholes to depths ranging from 4.6 to 6.1 metres below existing grade (mbeg).
4. Groundwater monitoring wells were installed within three (3) boreholes.
5. The borehole conditions observed were recorded, and representative samples of the soils were obtained. The ground at the boreholes was reinstated as close as possible to its original condition upon completion of the fieldwork.
6. Groundwater observations were obtained from the open boreholes during their advancement. Further, groundwater depth measurements were obtained from the three (3) monitoring wells on subsequent dates as described herein.

7. Geotechnical laboratory analyses of representative soil samples were performed, consisting of moisture content testing on all recovered soil samples, and grain size distribution testing on six (6) samples.
8. Geotechnical engineering analysis of acquired field and laboratory data, and preparation of this report summarizing Redstone's geotechnical findings and recommendations.

3.0 FIELD & LABORATORY PROCEDURES

A field investigation was conducted under the supervision of Redstone staff on May 5, 2025. The work consisted of subsurface exploration by means of advancing, sampling and logging seven (7) exploratory boreholes. Detailed logs of the boreholes were maintained, and representative samples of the materials encountered were obtained. The location of each borehole is illustrated on the attached Borehole Location Plan (Figure 1).

The boreholes were advanced using a track-mounted drill rig equipped with 130mm (5") Outside Diameter (OD) solid stem augers. Representative, disturbed samples of the strata penetrated were obtained either directly off the augers, or using a split-barrel, 50mm OD spoon sampler advanced by a 63.5 kg hammer dropping approximately 760mm. The results of these standard penetration tests (SPT's) are reported as "N" values on the borehole logs at the corresponding depths.

Redstone's senior geotechnical engineer witnessed each borehole advancement, with accompanying logging of the conditions and sampling of the soils encountered. Soil samples were recovered, retained in labeled air-tight containers, and secured for subsequent review and laboratory testing. Borehole logs are provided in Appendix A. The depth to any groundwater and/or borehole "cave-in" was measured in the open boreholes during their advancement. The boreholes were backfilled immediately after completion with the excavated soil, with bentonite pellets added into the boreholes.

Groundwater monitoring wells were installed in three (3) boreholes using 50mm OD PVC casing and slot 10 screens. The monitoring well installation details are presented graphically on the borehole logs. A well screen length of 3.0m was used in BH-1 while a screen length of 1.5m was used in BH-4 and BH-6. The screen was surrounded by filter pack sand to about 0.3m above the screen, then a bentonite seal plug to about 0.3m below the ground surface, with a PVC pipe stick-up of about 0.9m above grade, and a protective steel above-grade monument. Groundwater depth measurements were obtained from these wells by a representative of PV on May 8, 12, and 27 2025 and shared with Redstone. These monitoring wells remain in place as of writing this report.

The northing and easting coordinates of each borehole, and the ground surface elevations (geodetic) were surveyed by Engage and provided to Redstone. These values are included on the borehole logs. Elevations contained in this report are strictly for geotechnical engineering

analytical purposes only, and should be verified prior to finalizing any design or construction parameters upon which they are based.

Laboratory testing was performed on soil samples, consisting of moisture content testing of all recovered soil samples, and grain size distribution analyses on six (6) soil samples. The results of the moisture content and grain size distribution testing are presented on the borehole logs, while the grain size distribution testing charts are attached in Appendix B.

4.0 SITE LOCATION & SURFACE CONDITIONS

The Ph2 Development site is situated on the west side of Peterborough County Road 10 about 0.5km south of the intersection with Sharpe Line, and immediately south of what Redstone understands is this development's first phase (Ph1) that is currently being constructed around a roadway identified as Cameron Court. The project site currently has a civic address of 1812 County Road 10, in the Township of Cavan -Monaghan, County of Peterborough, Ontario.

As of the fieldwork performed for this study, the Ph2 Development site contains an entrance and driveway to a house recently constructed on Lot 4 (per the Site Plan). Beyond this existing house the remainder of the Ph2 Development site is undeveloped, consisting of farm fields with some tree lines. The overall topography of the site drops in elevation from the north to the south; based on ground surface elevations measured by Engage at the borehole locations, the site's surface elevation changes on the order of about 17m.

Surrounding properties include the municipal road (County Road 10) running approximately north-south along the site's eastern boundary, residential lots to the north, northwest, and southeast, and otherwise surrounded by undeveloped properties containing farmland and/or brush.

5.0 SUBSURFACE CONDITIONS

5.1 GENERAL

Details of the subsurface conditions encountered in the boreholes are presented graphically on the logs (see Appendix A). It should be noted that the boundaries between the strata have been inferred from borehole observations and non-continuous samples. They generally represent a transition from one soil type to another, and should not be inferred to represent an exact plane of geological change. Further, conditions may vary between and beyond the boreholes. Following is a general and summarized account of the subsurface conditions encountered in the boreholes from a geotechnical perspective.

The boreholes generally encountered a surficial layer of topsoil (overlain by fill in one borehole), over shallow organic-bearing soils, over till with sand layers or sand seams occurring within the till in some boreholes. Some boreholes exhibited caving/sloughing soils; groundwater was encountered in all but one borehole, at depths ranging between 0.5mbeg to 5.2mbeg.

The following sections describe the major soil strata and groundwater conditions encountered during this investigation in more detail.

5.2 FILL

A surficial layer of fill was encountered in borehole BH-2, to a depth of about 0.8mbeg. This fill material was dark brown and consisted of sand with gravel and cobbles, in a damp in-situ state.

5.3 TOPSOIL / ORGANIC SILT

Boreholes BH-1 and BH-3 to BH-7 encountered a surficial layer of topsoil. Borehole BH-2 encountered a layer of topsoil/organics immediately beneath the fill material. This topsoil layer ranges in thickness from about 0.1m to 0.4m.

Beneath the surficial topsoil, boreholes BH-1 and BH-4 to BH-7 exhibited a layer of organic-bearing material described as organic silt (noting that there was a variable and at time significant amount of sand also contained in this soil). This material is generally described as dark brown to reddish brown silt or silt and sand with clay, containing organic matter, in a moist, loose in-situ state. (Note that due to the nature of many areas of the Ph2 Development site being farm fields, it is possible that at least some of the soils immediately beneath the surficial topsoil may represent a layer that has been disturbed and mixed with organics through farm field activities such as tilling).

The organic nutrients and/or fertility properties of the topsoil and organic silt layers were not assessed as part of this study. Moisture content tests performed on samples of the organic silt ranged from about 22 to 28% moisture by dry weight. Grain size distribution analyses performed on two (2) samples of the soils described as organic silt yielded the following compositional ranges: 1 to 6% gravel, 31 to 42% sand, 39 to 57% silt, and 11 to 13% clay.

5.4 SILT / SILT & CLAY / CLAYEY SANDY SILT

Layers of soil described as either silt or silt and clay or clayey sandy silt were encountered in boreholes BH-6 and BH-7. In BH-6, silt and clay was present between 1.1 and 1.5mbeg, then silt from 1.5 to 2.3mbeg. In BH-7, silt and clay was present from 0.8 to 2.3mbeg, then clayey sandy silt present from 2.3 to 2.4mbeg.

The silt and clay is described as brown in colour, while the layers of silt and clayey sandy silt appeared grey. The silt and clay contained trace to some sand, and existed in a damp to moist, firm to stiff in-situ state of consistency. The silt and the clayey sandy silt contained varying amounts of sand and clay with trace gravel, and existed in a moist, firm to stiff in-situ state of consistency, based on visual-tactile examination and N-counts of 6 to 14 blows per 0.3m.

Moisture content tests performed on samples of these soils yielded values ranging from about 11 to 29% moisture by dry weight. A grain size distribution test performed on a sample of the clayey sandy silt suggests the following composition: 3% gravel, 28% sand, 35% silt, and 34% clay.

5.5 SAND

Layers (or seams or pockets) of sand were encountered within the till in boreholes BH-1, BH-2, BH-4, and BH-5. The sand was first observed at depths ranging between 2.4mbeg to 3.2mbeg, and extended to depths ranging between 2.6mbeg to 3.5mbeg.

The sand was generally brown and appeared occasionally fine-grained to more typically medium to coarse-grained, with silt and trace gravel appearing in BH-5, and existed in a moist to wet, compact to dense in-situ state of compactness based on visual-tactile examination and N-counts of 41 blows per 0.3m.

Moisture content tests conducted on samples of the sand yielded values ranging from approximately 8 to 16% moisture by dry weight. A grain size distribution analysis performed on a sample of the sand suggests the following composition: 6% gravel, 78% sand, and 18% silt and clay.

5.6 TILL

An underlying layer of till was encountered in all the boreholes. This soil was encountered at depths ranging between 0.2mbeg (BH-3) to 2.4mbeg (BH-7), and extended to the full depth of investigation in each borehole.

The till generally appeared light brown to brown to light grey to grey, and consisted primarily of silt and sand with typically lesser amounts of gravel and clay, and including cobbles (inferred from occasional auger grinding while advancing the boreholes through the till). As noted in Section 5.5, layers (or seams or pockets) of sand were encountered within the till in boreholes BH-1, BH-2, BH-4, and BH-5. (Note that such sand seams or layers can provide hydraulically-conductive zones where groundwater will more readily seep or infiltrate). The till was in a damp to moist wet to saturated condition; some upper zones occasionally exhibiting wet to saturated conditions, grading to damp to moist with depth. The till existed in a very loose to very dense in-situ state of relative compactness, based on visual-tactile examination and N-counts of 2 to greater than 100 blows per 0.3m.

Moisture content tests conducted on samples of the till yielded values of about 5% to 20% moisture by weight. Grain size distribution analyses performed on samples of the till suggest the following compositional ranges: 6 to 12% gravel, 31 to 49% sand, 29 to 38% silt, and 10 to 25% clay.

5.7 GROUNDWATER / CAVE-IN

Observations related to the presence of any groundwater seepage and accumulation within the open boreholes were recorded upon final extraction of the augers. All of the open boreholes (with the exception of BH-7) exhibited accumulation of water within them, at depths ranging from about 1.5mbeg (BH-5) to 5.2mbeg (BH-6).

Monitoring wells were installed in boreholes BH-1, BH-4, and BH-6 (see installation details on the logs in Appendix A), and groundwater depth readings were obtained from these three wells on May 8, 12, and 27 2025.

The following table summarizes the groundwater depths observed in the open boreholes and monitoring wells between May 5 (during drilling) and May 27.

Table 1: Groundwater Depth

BOREHOLE	DEPTH (mbeg)			
	Open Borehole	Monitoring Wells		
	May 5/25	May 8/25	May 12/25	May 27/25
BH-1	1.8	1.45	1.63	1.36
BH-2	3.5	no monitoring well installed		
BH-3	2.4			
BH-5	3.0	0.56	0.75	0.50
BH-6	1.5	no monitoring well installed		
BH-7	5.2	2.34	2.66	2.15

Observations regarding any cave-in (sloughing) of the soils forming the borehole walls were made during advancement and completion of the boreholes. Cave-in (sloughing) was observed within four boreholes (BH2 to BH-5), below depths ranging from about 3.7mbeg to 4.3mbeg.

It must be noted that the groundwater levels (and any related cave-in) are subject to seasonal fluctuations and in response to weather events, and at any point in time may differ from those presented herein. Also, the tendency for soils to cave-in (or slough or otherwise collapse) is a function of factors including its gradation, density or consistency, presence and any movement of groundwater, as well as the slope and area of the exposed soil face.

6.0 DISCUSSION & RECOMMENDATIONS

6.1 GENERAL

Supporting data upon which these recommendations are based have been presented in the foregoing sections of this report. The following recommendations are governed by the physical properties of the subsurface materials that were encountered at the site and assume that they are representative of the overall site conditions. It should be noted that these conclusions and recommendations are intended for use by the designers only. Contractors bidding on or undertaking any work at the site should examine the factual results of the assessment, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of this factual data as it affects their proposed construction techniques, equipment capabilities, costs, sequencing, and the like. Comments, techniques, or recommendations pertaining to construction must not be construed as instructions to the contractor. These recommendations are based on the project understandings outlined within this report. Should any of these parameters or understandings change, Redstone must be allowed to review the proposed changes and provide updated recommendations if warranted. It is expected that all applicable laws, regulations, and any site-specific requirements will be adhered to by the designers and contractors.

Information regarding the final proposed grading of the Ph2 Development (including road surfaces, service inverts, and house slabs) was not available to Redstone as of writing this report. These recommendations are therefore based on the assumptions that the final road and lot grades will closely match the existing grades, that the buildings will be typical 1 or 2 storey residential structures with or without basements, and service inverts will be no deeper than 3m below existing grade (mbeg). Should this not be the case, Redstone must be notified and allowed the opportunity to review these recommendations in light of any such updated project information.

Details regarding Redstone's conclusions and recommendations are outlined in the following sections.

6.2 SITE PREPARATION, EXCAVATION, & BACKFILL

All topsoil, vegetation, fill, disturbed earth, organics, and organic-bearing materials (including organic silts) must be stripped and removed from all new pavement and building (foundations and floor slab) areas prior to commencing earthwork construction. The subexcavated surfaces must be inspected and approved by a qualified geotechnical engineer's representative prior to placement of any fill, formwork, slabs or foundations.

Excavations should be carried out to conform to the manner specified in Ontario Regulation 213/91 and the Occupational Health and Safety Act and Regulations for Construction Projects (OHSA). All excavations above the water table not exceeding 1.2 m in depth may be constructed

with unsupported slopes. The soils encountered are generally classed by OHSA as Type 3 soil, requiring unsupported walls of excavations to be sloped to the bottom of the excavation with a gradient of 1 horizontal to 1 vertical (1H: 1V) or flatter, with the exception of zones of overly wet to saturated till and/or non-cohesive soils (sand layers), which will tend to cave/slough when located below the groundwater table, and as such must be considered Type 4 soils requiring unsupported walls of excavations in such soils to be sloped at 3H:1V or flatter to the base of the excavation.

If space is restricted such that the side slopes of excavations cannot be safely cut back in accordance with OHSA, and/or cave-in and sloughing are encountered in the excavations, and/or where the excavations are in close proximity to an existing structure (including a road, building or infrastructure), temporary shoring must be provided. To avoid overstressing of any shoring, the excavated materials must be placed away from the excavation perimeter at a minimum distance equalling 2 times the excavation's depth. Materials must not be stockpiled in close proximity to open excavations, and construction traffic must avoid being in proximity to open excavations. To protect against the adverse effects of erosion during construction, all ground surface drainage runoff should be directed away from the excavation area(s).

Prior to any off-site movement of excess soils generated during construction, it is recommended that an assessment be performed in accordance with O.Reg.406/19.

Some excavated inorganic soils may be suitable for use as trench or pavement subgrade backfill, although it must be noted that the native soils contained varying and sometimes higher levels of silt and/or clay, which can be highly susceptible to frost and moisture and/or become unworkable if overly wet – the contractor must be aware of this, and the need for ideal conditions before any excavated soils will be considered appropriate for reuse as backfill. Due to their occasionally finer-grained silty and/or clayey nature and resulting sensitivity to climatic conditions, the site soils should not be considered suitable for reuse as engineered backfill beneath any structures (including foundations and slabs). The reuse of any existing excavated material as such is conditional on it being workable, at a suitable moisture content, containing no organics, debris or other unsuitable / deleterious materials, no stones larger than 150mm diameter, and must receive final review and any approval for such reuse at the time of construction. Soils that are otherwise acceptable, but overly wet, will require prior processing (such as aeration) to lower their moisture content before being considered for approval as backfill material.

6.3 GROUNDWATER CONTROL DURING CONSTRUCTION

Where any groundwater is present during construction, it is cautioned that exposed soils can be easily disturbed, loosened, and/or exhibit sloughing and flowing characteristics unless properly managed including lowering of the groundwater to at least 1m below the base of all excavations, and protection of the exposed final excavation subgrades from weather, construction traffic, and other potential sources of disturbances such as upwards groundwater flow that can potentially cause boils, heave, or other subgrade-compromising conditions.

Excavations remaining above the groundwater table are not expected to encounter significant groundwater infiltration, and in such shallow excavations, any groundwater encountered is expected to be controlled by pumping from collection sumps to an acceptable outlet.

Should excavations extend deeper and/or otherwise encounter groundwater, this may require more intensive dewatering and/or groundwater control, including the use of filtered sumps, and/or other suitable methods of dewatering and/or sheet piling or other suitable shoring. In all cases, any groundwater level must be lowered and controlled at least 1m below the base of all excavations. If any excavations will extend into the groundwater table, it is recommended the Contractor retain an experienced and qualified groundwater control specialist for this project should any excavations extend below the groundwater.

If short-term pumping of groundwater at volumes greater than 50,000 L/day and less than 400,000 L/day is required during the construction stage, the Environmental Activity Sector Registry (EASR) must be completed. The EASR streamlines the process and water pumping may begin once the EASR registration is completed, the fee paid and supporting document prepared. If water taking in excess of 400,000 litres/day is required, a Permit to Take Water (PTTW) must be obtained in advance. Pumping discharges must conform to any requirements from the local municipalities, conservation agencies and any other jurisdictional agencies, as well as the MECP permitting.

The preceding comments are intended for general reference and information only. The volume of any water-taking will be dependent on the design as well as the contractor's sequencing, equipment, techniques and overall methods. The Contractor is solely responsible for the design and implementation of any required unwatering and/or dewatering, including requirements for withdrawal, handling, treatment, and discharge.

6.4 SERVICE INSTALLATION (BEDDING & COVER)

Based on the results of this investigation, proposed new service pipes within the Ph2 Development's road network are expected to be founded in the native soil deposits, no deeper than 3mbeg. No pipe support issues are anticipated where the piping will be founded in the aforementioned deposits provided all the recommendations contained in this report are adhered to. It is recommended that further inspections be carried out at the time of construction to verify that the subgrade soils exposed at the trench base are consistent with the findings in this report. A soft, unstable foundation may result in unequal settlement of the pipe causing broken backs or broken bellies. Low density soils may collapse upon wetting. Very wet, loose, unstable soils must be sub-excavated down to competent soils and be replaced under the guidance of the geotechnical engineering's representative, or alternative treatments as per the geotechnical engineer's guidance at the time of construction. Also, any bedding materials disturbed during construction must be removed. The disturbed material may be compacted back in place or imported material may be used to replace the disturbed material and then compacted, with approval from the geotechnical engineer's representative.

With consideration for the above, the expected bedding subgrade soils will provide adequate support for the proposed utility pipes, and will allow the use of normal Class B type bedding. Class B bedding is Granular A, or 19mm crusher run limestone, as per Ontario Provincial Standard Specifications (OPSS). Clear stone as bedding material should be used only if it is completely wrapped in a non-woven geotextile filter fabric and only with prior consent of the Municipality and geotechnical engineer.

The bedding subgrade must be inspected and approved by a qualified geotechnical engineer's representative prior to placement of bedding material to confirm that the subgrade conditions are consistent with those on which the recommendations contained herein are based on. Where unsuitable subgrade conditions are observed, efforts should be made to establish remedial procedures in the field so as to minimize construction delays.

The minimum recommended bedding thickness for the underground services is 150mm; where the subgrade is overly wet or weak, the minimum bedding thickness should be increased to 250mm. If the subgrade becomes unduly wet during construction, an additional lift of bedding material should be used. Where crossings of existing underground utilities are encountered along the proposed pipe alignment, the bedding thickness should be increased to at least 300mm. Attention should be given to ensure material placed beneath the pipe haunches is adequately compacted.

It is recommended that cover backfilling of the underground services be accomplished using Granular A, sand, or other suitable material as allowed by the Municipality's standards, to a minimum of 300mm above the pipe. Backfill within a 600mm thick zone above the pipe should be compacted with light equipment to avoid damaging the pipes.

Embedment, bedding, and cover materials must be placed in thin lifts not more than 150mm thick and compacted to at least 98% Standard Proctor Maximum Dry Density (SPMDD), as per ASTM D-698 procedures. Bedding and backfill materials and their compaction must be inspected and tested.

To minimize any long-term drainage effects caused by the service bedding, it is recommended that trench plugs formed using clay or unshrinkable concrete be utilized within the service trenches at appropriate locations. For details of trench plugs, refer to OPSD 802.095.

6.5 PAVEMENT STRUCTURE (ROAD, PARKING & ACCESS AREAS)

This section contains recommendations regarding design and construction of the new asphalt-paved roads for the Ph2 Development. These recommendations are based on the expectation that the vehicles will be typical passenger vehicles, with occasional heavier/commercial trucks (snow clearing, emergency, delivery, etc).

The following recommendations are provided for the new road, parking, and access areas of the development.

1. Per Section 6.2, remove unsuitable materials including existing topsoil, fill, organics and organic-bearing materials, and any other obviously deleterious materials to their full depth, as well as frozen earth and cobbles/boulders larger than 150mm in diameter encountered at subgrade elevation for the full width of construction.
2. Carefully proof-roll the subgrade in the presence of the geotechnical engineer's representative. Any overly soft or wet areas or other obviously deleterious materials must be excavated and properly replaced with suitable, approved backfill material.
3. Backfilling of sub-excavated areas and fine grading may be carried out using OPSS 1010 Granular B Type I or Select Subgrade Material (SSM). Organics, organic-bearing materials, and overly wet or silty/clayey soils are not suitable for reuse as backfill. All subgrade backfill materials should be placed in uniform lifts not exceeding 200mm loose thickness and compacted to at least 98% SPMDD.
4. Adequate drainage must be achieved throughout the pavement areas. Ensure positive slopes (combined with subdrains if necessary) within the pavement subgrade, to allow drainage and avoid any water accumulation. All such features must appropriately drain either to a storm sewer system or daylight to side ditches.
5. In any areas where the subgrade exhibits excessive amounts of moisture or groundwater accumulation, maximize the subgrade drainage by installing subdrains in the subgrade, consisting of 150mm diameter perforated subdrain pipe wrapped with knitted sock geotextile placed in a trench excavated 300mm by 300mm into the subgrade. The trench should be backfilled with 19mm clear stone. A geotextile filter fabric wrapping completely surrounding the 19mm clear stone is required.
6. To minimize the effects of frost on differing subgrade materials, construct transitions between varying depths of granular base materials at a rate of 1:10 or flatter.
7. Granular materials should consist of Granular A and B conforming to the requirements of OPSS Form 1010 or equivalent. All granular materials should have an in-situ moisture content within 2% of their respective optimal moisture content, to assist in achieving appropriate compaction. Granular A and B materials must be in accordance with OPSS Form 1010 or equivalent. The granular courses should be compacted to a minimum 100% of their respective SPMDDs.
8. All asphaltic concrete layers should be placed, spread, and compacted conforming to OPSS Form 310 or equivalent. All asphaltic concrete should be compacted to a minimum 92.0% of their respective laboratory Maximum Relative Densities (MRDs).

The subgrade soils at this site are expected to generally consist of native till, possibly zones of more silt and clay; based on the grain size analyses performed, the frost susceptibility of these

soils is assessed as being moderate, but with higher silt content will become increasingly frost susceptible.

The following table outlines recommendations for the road pavement structure:

Table 2: Pavement Structure - Roads

Profile	Material	Minimum Thickness (mm)	Per OPSS
Asphalt Surface	HL 3	50	1150
Asphalt Base	HL 8	50	
Granular Base	Granular A	150	1010
Granular Subbase	Granular B Type I	450	

The above-recommended pavement structures are for the end use of the project. During construction of the project, the recommended granular depths may not be sufficient to support loadings encountered including construction traffic and equipment.

The foregoing design considers that construction is carried out during dry periods, at the appropriate above-freezing temperatures, and that the subgrade is stable under construction equipment loadings. If construction is carried out during wet weather and heaving or rolling of the subgrade is experienced from the proof-rolling program, additional thickness of granular materials, geo-grids reinforcement or a combination of the two may be required.

The requirement for additional granular materials and / or utilization of geo-grids is best determined during construction under the direction of the geotechnical engineer. However, in view of the above, it is recommended that contingency items be included in the contract for subgrade stabilization using either technique so that such methods are contractually available, if and when needed during construction.

All asphaltic concrete layers should be placed, spread, and compacted confirming to OPSS Form 310 or equivalent. All asphaltic concrete should be compacted to a minimum 92.0% of their respective laboratory Maximum Relative Densities (MRDs).

6.6 FOUNDATIONS

The recommendations provided herein are based on the borehole information obtained during Redstone's fieldwork. Updates to the commentary and recommendations can be on-going as new information of the underground conditions becomes available. For example, more specific subsurface information becomes available once excavations and foundation construction is underway. In all cases, prior to placement of any lean concrete, fill, formwork, or foundations, all excavations must be inspected and approved by a qualified geotechnical engineer's representative. This will ensure that the foundation bearing material has been prepared properly at the foundation subgrade level and that the founding subgrade materials exposed are similar to those encountered during this investigation. Under no circumstances should the foundations

be placed directly on organic materials, loose, frozen subgrade, construction debris, or within ponded water.

It is Redstone's assumption that the final lot grades will closely match the existing grades, and that the buildings will be typical 1 or 2 storey residential structures with or without basements.

Structural loading for the proposed buildings may be supported on reinforced strip and spread concrete footings placed on the undisturbed, compact to dense native soils, or on engineered fill placed directly on such soil.

The following table outlines the depths (and corresponding elevations) at which suitably competent soils were encountered in each borehole for foundation purposes.

Table 3: Depths (Elevations) to Suitably Competent Founding Soil

Borehole	Depth (mbeg)	Elevation (m)
BH-1	2.3	264.6
BH-2	1.2	273.1
BH-3	1.2	262.3
BH-4	1.2	260.8
BH-5	1.6	258.4
BH-6	2.3	255.5
BH-7	1.7	255.6

For design purposes, it is recommended that footing foundations be proportioned using the following parameters:

Table 4: Bearing Capacity Pressure / Geotechnical Resistance for Footings

PARAMETER (kPa)	UNDISTURBED COMPACT TO DENSE NATIVE SOIL	ENGINEERED FILL ⁽¹⁾	
		Rock-based	Granular
Bearing Capacity Pressure (SLS)	120	150	120
Geotechnical Resistance (ULS), resistance factor $\Phi = 0.5$ applied	180	225	180

(1) At least 0.6m of Rock-based Fill, at least 0.3m of Granular Fill. Quality of material is to be approved prior to use as engineered fill.

The following steps are recommended for the construction of any engineered fill:

1. Prepare the subgrade in accordance with Section 6.2 of this report. This includes removing any and all existing vegetation, topsoil, fill, disturbed earth, construction debris, organics, and organic-bearing soils to the competent, undisturbed compact native soil from within the area of the proposed engineered fill.
2. The minimum area of the engineered fill should extend horizontally at least 1m beyond the outside edge of the proposed foundations and then extend downward at a 1:1 slope to the suitable subgrade.

3. The base of the engineered fill area must be approved by a qualified geotechnical engineer's representative prior to placement of any fill, to ensure that all unsuitable materials have been removed, that the materials encountered are similar to those observed during this investigation, and that the subgrade is suitable for the engineered fill.
4. All engineered fill material is to be approved by a qualified geotechnical engineer's representative at the time of construction prior to its use.
5. Place approved engineered fill, in maximum 200mm loose lifts, compacted to 100% of its SPMDD. Any fill material placed under wet conditions should consist of an approved, rock-based fill surrounded by an appropriate geotextile filter fabric should the rock fill be "clean" (i.e., contain voids due to lack of finer-grained particles).
6. Full time testing and inspection of the engineered fill will be required, to ensure compliance with material and compaction specifications.

Any engineered fill upon which the footings are placed must be a minimum thickness per the footnote to Table 4, and the quality of any material considered for engineered fill must be approved prior to its use. Rock-based fill must be completely surrounded with suitable filter fabric (placed in accordance with manufacturer's specifications) to minimize any migration of fines from surrounding soils into the rock fill voids.

Self-weight settlement of engineered fill soil compacted to 98% to 100% of its SPMDD will depend on soil texture but should be anticipated to be in the range of 0.5% to 0.75% of the fill height. The rate of the settlement will also be a function of soil texture. For engineered fill consisting of Granular B material, a major portion (80% or higher) of the settlement due to the self-weight is expected to be completed during the construction stage before the placement of overlying features.

Footings and foundation walls must be suitably reinforced; as a minimum, and unless specified otherwise on the structural drawings, such reinforcement should consist of 2 continuous runs of 15M rebar throughout the footings, and 2 continuous runs of 15M rebar throughout the top and bottom of the foundation walls.

For frost protection purposes, the footings must be covered by at least 1.2m of earth (or equivalent) in all directions. Backfill to foundations should be accomplished using non-frost susceptible Granular B material.

To assist in managing surficial drainage water and any infiltration of groundwater towards the buildings, any crawlspace or basement walls must be water-proofed with suitable membrane and drainage board elements, and accompanied by an appropriately-outletted perimeter foundation drainage system around the building's full perimeter.

For design purposes this site is classed as Site Class D for Seismic Site Response, in accordance with the Ontario Building Code (OBC). A higher seismic site classification may be achievable (but

not assured) through an assessment of the site's average shear wave velocities based on a Multi-channel Analysis of Surface Waves (MASW) or other suitable geophysical survey.

6.7 SLAB ON GRADE

The floors of the proposed new buildings may be constructed as normal slabs-on-grade, on granular or clearstone fill, over native, inorganic subsoils prepared in accordance with Section 6.2 of this report. The slabs should be formed over a base course consisting of at least 150mm of either Granular A backfill as per OPSS (beneath non-basement slabs) or 19mm clearstone backfill (beneath crawlspace and/or basement slabs), compacted to a minimum 100% of its SPMDD. All grade increases or infilling below the granular or clearstone should utilize well graded, free draining Granular B Type I backfill as per OPSS 1010, placed in lifts no thicker than 200mm before compaction, and compacted to a minimum of 100% of its SPMDD. All grade increases or infilling below the Granular A should be constructed in accordance with the engineered fill steps provided in Section 6.6 of this report.

All fill placed beneath the slabs must be inspected, approved and compaction verified by a qualified geotechnical engineer's representative. Drainage conditions below the slabs must be optimized in all cases, including surficial grading to redirect any surficial water flow away from the building. If basement excavations encounter sufficient groundwater, appropriately-outletted underslab drains may be required pending a geotechnical review of such conditions.

6.8 BASEMENT & EARTH RETAINING WALLS

Any subsurface structures retaining earth (including basement foundation walls and/or retaining walls) that are located above the groundwater table may be designed for lateral (horizontal) earth pressures using the following equation:

- $p = k (w h + q)$, where:
 - p = the lateral earth pressure in kPa acting on the subsurface structure at depth h ;
 - k_a = the coefficient of active earth pressure;
 - = 0.3 for walls restrained from the bottom only;
 - = 0.5 for walls restrained at the top and bottom. (This value is recommended for rigid walls retaining compacted backfill);
 - k_p = the coefficient of passive earth pressure, ($= 3.0$);
 - w = the granular or native soil bulk density in kN/m^3 ;
 - = 21 kN/m^3 for well compacted, OPSS-approved Granular "B";
 - = 19 kN/m^3 for native soils;
 - h = the depth (in metres) below the exterior grade at which the earth pressure is being calculated; and
 - q = the equivalent value of any surcharge (in kN/m^2) acting on the ground surface adjacent to the structure.

The recommended value for the coefficient for sliding friction between the soil and the concrete is 0.4. In addition to the above, hydrostatic forces must be taken into account in the design where the retaining structure extends below the groundwater table. Also, any additional surcharge loading that will influence the retaining structure must be taken into account in its design.

6.9 GENERAL RECOMMENDATIONS

6.9.1 Subsoil Sensitivity

The native subgrade soils are susceptible to strength loss or deformation if saturated or disturbed by construction traffic. Therefore, where the subgrade consists of approved soil, care must be taken to protect the exposed subgrade from excess moisture and from construction traffic. If there is site work carried out during periods of wet weather and/or elevated groundwater levels, then it can be expected that the subgrade will be disturbed unless a suitable working surface is provided to protect the integrity of the subgrade soils from construction traffic. Subgrade soil preparation work cannot be adequately accomplished during overly wet weather, and the project must be scheduled accordingly.

6.9.2 Test Pits During Tendering

The Client may consider excavating test pits at representative locations of this site during the construction tendering phase, with mandatory attendance of bidding Contractors. This would ensure they make their own assessments of the ground conditions, and how these will affect their proposed construction methods, techniques and schedules.

6.9.3 Winter Construction

The subsoils encountered at the site can be frost-susceptible and freezing conditions could cause problems to preparations for foundation, sidewalks and/or pavement subgrades. As preventive measures, the following is recommended:

1. Exposed surfaces intended to support foundations must be protected against freezing by means of loose straw and tarpaulins, heating, etc.
2. Care must be exercised so that any sidewalks and/or asphalt pavements do not interfere with the opening of doors during the winter when the soils are subject to frost heave. This problem may be minimized by any one of several means including (but not necessarily limited to) keeping the doors well above outside grade, installing structural slabs at the doors, and/or by using well graded backfill and positive drainage.
3. Because of the potential for soils to experience frost heave during winter, it is recommended that exterior service trenches be excavated with shallow transition slopes to minimize the abrupt change in density and frost-susceptibility between the granular backfill (relatively non-frost susceptible) and native soils (generally more frost-susceptible).

6.9.4 Design Review & Construction Inspections

Due to the preliminary nature of the design details at the time of this report, Redstone must be allowed to review the design and proposed grading plans prior to their finalization, and provide updated recommendations if necessary at that time. In addition, it is strongly recommended that Redstone be retained to review the related earthworks specifications when they are available.

During construction, experienced geotechnical staff must observe construction activities and ensure geotechnical recommendations are carried out.

6.9.5 Hydrogeological Assessment

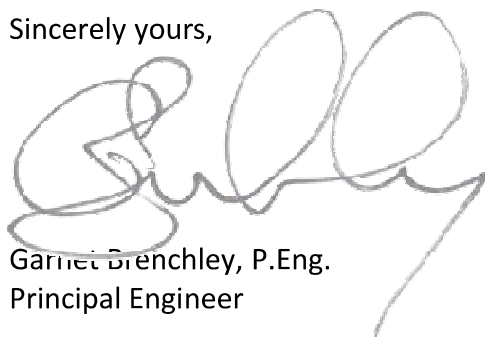
It is Redstone's understanding that a hydrogeological assessment is being performed for the Ph2 Development by Pigeonview Consulting Inc (Pigeonview) under direct contract with the Client. Pigeonview's hydrogeological assessment will utilize Redstone's borehole and geotechnical lab testing results (contained herein as Appendices A and B), and will be summarized under separate cover and reporting addressed to the Client. Pigeonview will make their own assessments and conclusions regarding the ground conditions as they relate to their hydrogeological commentary, conclusions, and recommendations

7.0 CLOSURE & STATEMENT OF LIMITATIONS

The recommendations made in this report are in accordance with Redstone's present understanding of the project. The subsurface investigation was performed in accordance with current, generally accepted guidelines. However, should any conditions at the site be encountered which differ from those at the borehole locations, it is requested that Redstone be notified immediately in order to permit a reassessment of these recommendations in light of the changed conditions and exact project details. Redstone requests that they be permitted to review the recommendations of this report after the drawings and specifications are complete, or if the final project details should differ from that mentioned in this report.

The attached Statement of Limitations is an integral part of this report. Should questions arise regarding any aspect of this report, please contact our office.

Sincerely yours,



Garnet Branchley, P.Eng.
Principal Engineer



STATEMENT OF LIMITATIONS

This report is intended solely for Mr. Ian Cameron and other parties explicitly identified in the report and is prohibited for use by others without Redstone's prior written consent. This report is considered Redstone's professional work product and shall remain the sole property of Redstone. Any unauthorized reuse, redistribution of or reliance on the report shall be at the Client and recipient's sole risk, without liability to Redstone. Client shall defend, indemnify and hold Redstone harmless from any liability arising from or related to Client's unauthorized distribution of the report. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include all supporting drawings and appendices.

The recommendations made in this report are in accordance with our present understanding of the project, the current site use, ground surface elevations and conditions, and are based on the work scope approved by the Client and described in the report. The services were performed in a manner consistent with that level of care and skill ordinarily exercised by members of geotechnical engineering professions currently practicing under similar conditions in the same locality. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

All details of design and construction are rarely known at the time of completion of a geotechnical study. The recommendations and comments made in the study report are based on our subsurface investigation and resulting understanding of the project, as defined at the time of the study. We should be retained to review our recommendations when the drawings and specifications are complete. Without this review, Redstone will not be liable for any misunderstanding of our recommendations or their application and adaptation into the final design.

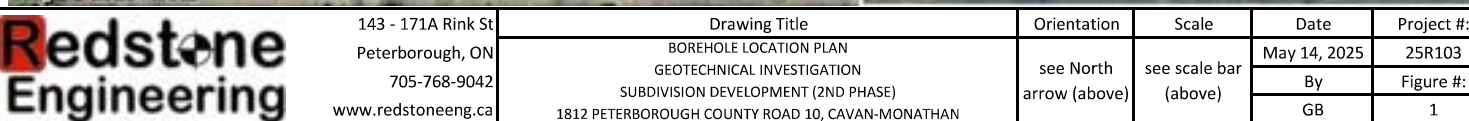
By issuing this report, Redstone is the geotechnical engineer of record. It is recommended that Redstone be retained during construction of any and all foundations, and during earthwork operations to confirm the conditions of the subsoil are actually similar to those observed during our study. The intent of this requirement is to verify that conditions encountered during construction are consistent with the findings in the report and that inherent knowledge developed as part of our study is correctly carried forward to the construction phases.

It is important to emphasize that a soil investigation is, in fact, a random sampling of a site and the comments included in this report are based on the results obtained at the seven (7) borehole locations only. The subsurface conditions confirmed at these seven (7) locations may vary at other locations. The subsurface conditions can also be significantly modified by construction activities on site (ex. excavation, dewatering and drainage, blasting, pile driving, etc.). These conditions can also be modified by exposure of soils or bedrock to humidity, dry periods or frost. Soil and groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations and conditions may become apparent during construction which could not be detected or anticipated at the time of our investigation. Should any conditions at the site be encountered which differ from those found at the test locations, we request that we be notified immediately in order to permit a reassessment of our recommendations. If changed conditions are identified during construction, no matter how minor, the recommendations in this report shall be considered invalid until sufficient review and written assessment of said conditions by Redstone is completed.

FIGURES

- base image = Google Earth imagery dated 08/18/2023 (does not necessarily reflect the current site conditions); and
- overlay image = portion of drawing by EcoLine Design Studio, titled "Site Plan, 1812 County Road 10, Ida, ON - Site Plan", Project No. KMD 2024-54, Sheet No. A0, dated September 2024 (positioning on base image is +/- approximate)

© Borehole



APPENDIX A

BOREHOLE LOGS

PROJECT NUMBER 25R103	DRILLING COMPANY G.E.T. Drilling	COORDINATES 4899252.877, 701512.640
PROJECT NAME Subdivision Devpt (2nd Phase)	LICENCE # 7085	COORDINATE SYSTEM Northing / Easting
CLIENT Ian Cameron	DRILLER M. Turnbull	GROUND SURFACE ELEV (m) 266.875
SITE ADDRESS 1812 County Road 10	DRILL RIG Track-Mounted CME	TOP OF WELL CASING ELEV (m) 267.78
..... Village of Ida	DRILLING METHOD Solid Augers, Split Spoons	TOTAL DEPTH (m) 4.9
..... Twp of Cavan-Monaghan, ON	DATE DRILLED May 5, 2025	LOGGED BY Garnet Brenchley, P.Eng.
WELL COMPLETION Well Tag #A420778	CASING 0.90m above gr to 1.50m below gr	SCREEN 1.50m below gr to 4.55m below gr
COMMENTS Drill method: AU=Solid augers & split spoons. Coordinates and ground surface elevation surveyed and provided by Engage Engineering		

Depth (m)	Drilling Method	Sample (Interval and Type)	SPT (N) value or TCR, SCR, RQD	Moisture Cont (%)	Groundwater	Well Monitor Details	Stratigraphy	Stratigraphic Description	Depth (m)	Additional Observations & Remarks	Elevation (m)
0.5	AU							TOPSOIL	0.4		266.5
1		SS-1	3 (2,2,1,3)	21.9				ORGANIC SILT - dark brown reddish brown mottled Silt and Sand with Clay, Organics throughout, moist, loose (possible Fill or Disturbed Soil)	1.2	SS-1: 6% Gravel, 42% Sand, 39% Silt, 13% Clay	266
1.5					▽ 4 ▽ 2			TILL - grey Silt and Sand with Gravel, wet to saturated, loose		Groundwater: 1) present in open borehole at about 1.8m below grade (bg) upon extraction of augers 2) May 8/25 = 1.45m bg 3) May 12/25 = 1.63m bg 4) May 27/25 = 1.36m bg	265.5
2		SS-2	2 (1,1,1)	18.3	▽ 3 ▽ 1				2.3		265
2.5		SS-3	15 (7,9,6,5)	11.1				Wet, compact	3.2		264.5
3									3.5		264
3.5		SS-4	41 (9,17,24)	8.0				SAND - brown Sand, medium-grained, moist, compact			263.5
4								TILL - grey Silty Sand with Gravel, damp, dense to very dense		Slower auger advancement below 3.5m	263
4.5		SS-5	>100 (34,39,50=2")	10.5					4.9	Borehole open to full depth upon final extraction of augers	262.5
5								Borehole terminated			262
5.5											261.5
6											261

PROJECT NUMBER 25R103	DRILLING COMPANY G.E.T. Drilling	COORDINATES 4899208.763, 701378.245
PROJECT NAME Subdivision Devpt (2nd Phase)	LICENCE # 7085	COORDINATE SYSTEM Northing / Easting
CLIENT Ian Cameron	DRILLER M. Turnbull	GROUND SURFACE ELEV (m) 274.341
SITE ADDRESS 1812 County Road 10	DRILL RIG Track-Mounted CME	TOP OF WELL CASING ELEV (m) n/a
..... Village of Ida	DRILLING METHOD Solid Augers, Split Spoons	TOTAL DEPTH (m) 4.6
..... Twnp of Cavan-Monaghan, ON	DATE DRILLED May 5, 2025	LOGGED BY Garnet Brenchley, P.Eng.
WELL COMPLETION no well		
CASING no well		
SCREEN no well		
COMMENTS Drill method: AU=Solid augers & split spoons. Coordinates and ground surface elevation surveyed and provided by Engage Engineering		

Depth (m)	Drilling Method	Sample (Interval and Type)	SPT (N) value or TCR, SCR, RQD	Moisture Cont (%)	Groundwater	Well Monitor Details	Stratigraphy	Stratigraphic Description	Depth (m)	Additional Observations & Remarks	Elevation (m)
0.5	AU	AS-1		8.8				FILL - dark brown Sand with Gravel, Cobbles present, damp			274
									0.8		
1		SS-2	19 (2,9,10,17)	7.8				TOPSOIL / ORGANICS	0.9		273.5
1.5								TILL - light brown Sandy Silt with Gravel, occasional Cobbles, damp, compact			273
									1.5		
2		SS-3	58 (8,50=6")	8.0				Dense			272.5
									2.3		
2.5		SS-4	48 (24,22,26)	8.3				Silty Sand with Gravel with Clay, brown	2.4		272
								SAND - brown Sand, fine-grained, moist to wet, compact to dense	2.6	SS-4 (till portion): 12% Gravel, 49% Sand, 29% Silt, 10% Clay	
3								TILL - grey Silty Sand with Gravel with Clay, moist, dense			271.5
									3.1		
3.5		SS-5	64 (14,50=5")	4.8				Grey Silty Sand with Gravel, occasional Cobbles			271
4		AS-6		9.8					3.7	Groundwater: present in open borehole at about 3.5m below grade (bg) on extraction of augers	270.5
4.5										Borehole walls caved below 3.9m depth on extraction of augers	270
									4.6		
5								Borehole terminated			269.5
5.5											269
6											268.5

PROJECT NUMBER 25R103	DRILLING COMPANY G.E.T. Drilling	COORDINATES 4899110.492, 701406.420
PROJECT NAME Subdivision Devpt (2nd Phase)	LICENCE # 7085	COORDINATE SYSTEM Northing / Easting
CLIENT Ian Cameron	DRILLER M. Turnbull	GROUND SURFACE ELEV (m) 263.486
SITE ADDRESS 1812 County Road 10	DRILL RIG Track-Mounted CME	TOP OF WELL CASING ELEV (m) n/a
..... Village of Ida	DRILLING METHOD Solid Augers, Split Spoons	TOTAL DEPTH (m) 4.6
..... Twnp of Cavan-Monaghan, ON	DATE DRILLED May 5, 2025	LOGGED BY Garnet Brenchley, P.Eng.
WELL COMPLETION no well		
CASING no well		
SCREEN no well		
COMMENTS Drill method: AU=Solid augers & split spoons. Coordinates and ground surface elevation surveyed and provided by Engage Engineering		

Depth (m)	Drilling Method	Sample (Interval and Type)	SPT (N) value or TCR, SCR, RQD	Moisture Cont (%)	Groundwater	Well Monitor Details	Stratigraphy	Stratigraphic Description	Depth (m)	Additional Observations & Remarks	Elevation (m)
0.5	AU							TOPSOIL	0.2		263
1		SS-1	14 (3,4,10,10)	13.1				TILL - brown Sandy Clayey Silt trace Gravel, stiff to hard, damp		SS-1: 6% Gravel, 31% Sand, 38% Silt, 25% Clay	262.5
1.5									1.5		262
2		SS-2	22 (3,9,13)	10.3				With Gravel, compact / hard			261.5
2.5									2.1		261
3		SS-3	34 (11,20,14)	6.8				Silty Sand with Gravel, damp, dense		Groundwater: present in open borehole at about 2.4m below grade (bg) on extraction of augers	260.5
3.5									3.1		260
4		SS-4	39 (9,16,23)	10.5				Grey, moist, dense			259.5
4.5		AS-5		14.8					4.6	Borehole walls caved below 4.3m depth on extraction of augers	259
5								Borehole terminated			258.5
5.5											258
6											257.5

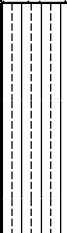
PROJECT NUMBER 25R103	DRILLING COMPANY G.E.T. Drilling	COORDINATES 4898982.964, 701348.097
PROJECT NAME Subdivision Devpt (2nd Phase)	LICENCE # 7085	COORDINATE SYSTEM Northing / Easting
CLIENT Ian Cameron	DRILLER M. Turnbull	GROUND SURFACE ELEV (m) 262.029
SITE ADDRESS 1812 County Road 10	DRILL RIG Track-Mounted CME	TOP OF WELL CASING ELEV (m) 262.87
..... Village of Ida	DRILLING METHOD Solid Augers, Split Spoons	TOTAL DEPTH (m) 4.6
..... Twnp of Cavan-Monaghan, ON	DATE DRILLED May 5, 2025	LOGGED BY Garnet Brenchley, P.Eng.
WELL COMPLETION Well Tag #A420780		
CASING 0.84m above gr to 2.47m below gr		
SCREEN 2.47m below gr to 3.99m below gr		
COMMENTS Drill method: AU=Solid augers & split spoons. Coordinates and ground surface elevation surveyed and provided by Engage Engineering		

Depth (m)	Drilling Method	Sample (Interval and Type)	SPT (N) value or TCR, SCR, RQD	Moisture Cont (%)	Groundwater	Well Monitor Details	Stratigraphy	Stratigraphic Description	Depth (m)	Additional Observations & Remarks	Elevation (m)
0.5	AU							TOPSOIL	0.4		262
1		SS-1	22 (15,7,15,17)	7.3				ORGANIC SILT - dark brown reddish brown Silt with Sand, Organics throughout, moist, loose	0.5		261.5
1.5		SS-2	77 (25,27,50)	5.0				TILL - light brown Silt and Sand with Gravel, trace to some Clay, damp, compact	1.5	Groundwater: 1) present in open borehole at about 3.0m below grade (bg) upon extraction of augers 2) May 8/25 = 0.56m bg 3) May 12/25 = 0.75m bg 4) May 27/25 = 0.50m bg	261
2								Brown Silty Sand with Gravel, damp, dense to very dense			260.5
2.5		SS-3	79 (29,50=6")	5.3							260
3		SS-4	100 (50=6")	15.5				SAND - brown Sand, medium to coarse-grained, wet, dense	3.1		259.5
3.5								TILL - grey Silty Sand with Gravel, damp, dense to very dense	3.2		259
4		AS-5		12.1						Slower auger advancement below 3.2m	258.5
4.5										Borehole walls caved below 3.9m depth on extraction of augers	258
5								Borehole terminated	4.6		257.5
5.5											257
6											256.5
											256

PROJECT NUMBER 25R103	DRILLING COMPANY G.E.T. Drilling	COORDINATES 4899041.019, 701452.612
PROJECT NAME Subdivision Devpt (2nd Phase)	LICENCE # 7085	COORDINATE SYSTEM Northing / Easting
CLIENT Ian Cameron	DRILLER M. Turnbull	GROUND SURFACE ELEV (m) 259.968
SITE ADDRESS 1812 County Road 10	DRILL RIG Track-Mounted CME	TOP OF WELL CASING ELEV (m) n/a
..... Village of Ida	DRILLING METHOD Solid Augers, Split Spoons	TOTAL DEPTH (m) 4.6
..... Twnp of Cavan-Monaghan, ON	DATE DRILLED May 5, 2025	LOGGED BY Garnet Brenchley, P.Eng.

WELL COMPLETION no well	CASING no well	SCREEN no well
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COMMENTS Drill method: AU=Solid augers & split spoons. Coordinates and ground surface elevation surveyed and provided by Engage Engineering

Depth (m)	Drilling Method	Sample (Interval and Type)	SPT (N) value or TCR, SCR, RQD	Moisture Cont (%)	Groundwater	Well Monitor Details	Stratigraphy	Stratigraphic Description	Depth (m)	Additional Observations & Remarks	Elevation (m)
0.5	AU							TOPSOIL	0.4		259.5
1		SS-1	3 (1,1,2,2)	27.8				ORGANIC SILT - dark brown reddish brown Sandy Silt with Clay, Organics throughout, wet, loose		SS-1: 1% Gravel, 31% Sand, 57% Silt, 11% Clay	259
1.5		SS-2	16 (6,10,6)	12.4				TILL - brown Silty Sand with trace Gravel, moist to wet, compact	1.5	Groundwater: present in open borehole at about 1.5m below grade (bg) on extraction of augers	258.5
2											258
2.5		SS-3a	76	11.5					2.4		257.5
		SS-3b	(26,50=6")	9.2				SAND - brown Sand (medium to coarse grained) with Silt, trace Gravel, wet, dense		SS-3b: 6% Gravel, 76% Sand, 18% Silt and Clay	257
3											257
		SS-4	>100 (16,30, 50=2")	7.2					3.3		256.5
3.5								TILL - grey Silty Sand with Gravel, moist, very dense		Borehole walls caved below 3.7m depth on extraction of augers	256
4		AS-5		19.8							255.5
4.5									4.6		255.5
5								Borehole terminated			255
5.5											254.5
6											254

PROJECT NUMBER 25R103	DRILLING COMPANY G.E.T. Drilling	COORDINATES 4899081.192, 701583.366
PROJECT NAME Subdivision Devpt (2nd Phase)	LICENCE # 7085	COORDINATE SYSTEM Northing / Easting
CLIENT Ian Cameron	DRILLER M. Turnbull	GROUND SURFACE ELEV (m) 257.777
SITE ADDRESS 1812 County Road 10	DRILL RIG Track-Mounted CME	TOP OF WELL CASING ELEV (m) 258.65
..... Village of Ida	DRILLING METHOD Solid Augers, Split Spoons	TOTAL DEPTH (m) 6.1
..... Twnp of Cavan-Monaghan, ON	DATE DRILLED May 5, 2025	LOGGED BY Garnet Brenchley, P.Eng.
WELL COMPLETION Well Tag #A420779		
CASING 0.87m above gr to 4.58m below gr		SCREEN 4.58m below gr to 6.10m below gr
COMMENTS Drill method: AU=Solid augers & split spoons. Coordinates and ground surface elevation surveyed and provided by Engage Engineering		

Depth (m)	Drilling Method	Sample (Interval and Type)	SPT (N) value or TCR, SCR, RQD	Moisture Cont (%)	Groundwater	Well Monitor Details	Stratigraphy	Stratigraphic Description	Depth (m)	Additional Observations & Remarks	Elevation (m)
0.5	AU							TOPSOIL	0.4		257.5
1		SS-1	6 (1,2,4,6)	18.9				ORGANIC SILT - dark brown reddish brown mottled Silt with Sand, Organics throughout, moist, loose	1.1		257
1.5								SILT and CLAY - brown Silt and Clay, moist, firm to stiff	1.5		256.5
2		SS-2	10 (5,5,5)	10.9				SILT - grey Silt with sand and Clay, trace Gravel, moist, stiff	2.3		256
2.5					▽ 4			TILL - light grey Silt and Sand with Clay, trace to some Gravel, moist, compact	2.3		255.5
3		SS-3	24 (6,8,16)	8.1	▽ 2					Groundwater: 1) present in open borehole at about 5.2m below grade (bg) upon extraction of augers 2) May 8/25 = 2.34m bg 3) May 12/25 = 2.66m bg 4) May 27/25 = 2.15m bg	255
3.5		SS-4	69 (11,19,50=6")	10.6	▽ 3			Increased Gravel, dense	3.1		254.5
4		AS-5		10.8				Damp	3.7	Slower auger advancement below 3.7m	254
4.5											253.5
5											253
5.5		AS-6		18.3		▽ 1					252.5
6									6.1	Borehole open to full depth upon final extraction of augers	252
								Borehole terminated			251.5

PROJECT NUMBER 25R103	DRILLING COMPANY G.E.T. Drilling	COORDINATES 4898928.208, 701470.842
PROJECT NAME Subdivision Devpt (2nd Phase)	LICENCE # 7085	COORDINATE SYSTEM Northing / Easting
CLIENT Ian Cameron	DRILLER M. Turnbull	GROUND SURFACE ELEV (m) 257.262
SITE ADDRESS 1812 County Road 10	DRILL RIG Track-Mounted CME	TOP OF WELL CASING ELEV (m) n/a
..... Village of Ida	DRILLING METHOD Solid Augers, Split Spoons	TOTAL DEPTH (m) 5.0
..... Twnp of Cavan-Monaghan, ON	DATE DRILLED May 5, 2025	LOGGED BY Garnet Brenchley, P.Eng.

WELL COMPLETION no well	CASING no well	SCREEN no well
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COMMENTS Drill method: AU=Solid augers & split spoons. Coordinates and ground surface elevation surveyed and provided by Engage Engineering

Depth (m)	Drilling Method	Sample (Interval and Type)	SPT (N) value or TCR, SCR, RQD	Moisture Cont (%)	Groundwater	Well Monitor Details	Stratigraphy	Stratigraphic Description	Depth (m)	Additional Observations & Remarks	Elevation (m)
0.5	AU							TOPSOIL	0.4		257
1		SS-1	10 (3,6,4,7)	28.6				ORGANIC SILT - dark brown reddish brown Silt and Sand, Organics throughout, wet, loose	0.8		256.5
1.5								SILT and CLAY - brown Silt and Clay, damp, firm to stiff			256
2		SS-2	14 (4,6,8)	25.8				Trace to some Sand	1.5		255.5
2.5								CLAYEY SANDY SILT - grey Clayey Sandy Silt, trace Gravel, moist, firm to stiff	2.3		255
3		SS-3	14 (4,5,9)	17.7				TILL - grey Silty Sand with trace Gravel trace Clay, moist, compact	2.4	SS-3 (Silt/Clay portion): 3% Gravel, 28% Sand, 35% Silt, 34% Clay	254.5
3.5											254
4		SS-4	17 (2,8,9)	10.9							253.5
4.5											253
5		SS-5	23 (5,8,15)	8.6						Borehole was open to full depth and free of any accumulated groundwater on extraction of augers	252.5
5.5								Borehole terminated	5.0		252
6											251.5
											251

APPENDIX B

LABORATORY DATA

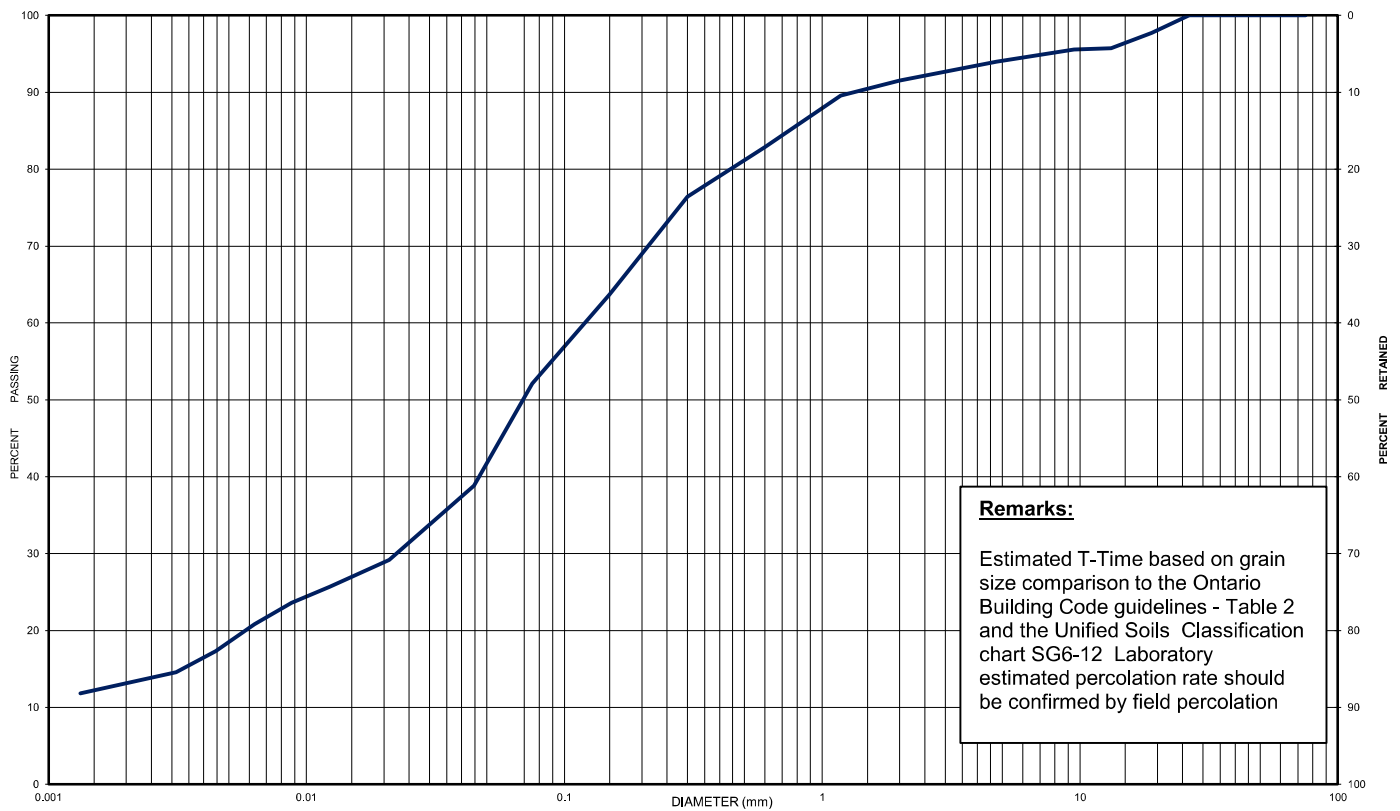
GRAIN SIZE DISTRIBUTION CHART

Client: *Redstone Engineering*
 Project: *Ida Subdivision - Phase 2*
 Sampled By: *Garnet Brenchley*
 Sample No.: *BH-1 - SS-1*

Project No.: *25R103*
 Location: *Ida, Ontario*
 Date: *May 7, 2025*
 Depth: *2.5 - 4.5'*

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT (<0.075mm)	SAND (<4.75 to 0.075mm)			GRAVEL (>4.75mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	VERY FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Description			Moisture (%)	Gravel	Sand	Silt	Clay	Class.
<i>BH-1 - SS-1</i>	<i>Silty SAND some clay trace of gravel</i>			<i>21.9</i>	<i>6</i>	<i>42</i>	<i>39</i>	<i>13</i>	<i>ML</i>
<i>D₆₀</i>	<i>D₃₀</i>	<i>D₁₀</i>	<i>C_u</i>	<i>C_c</i>	<i>Estimated Coefficient of Permeability</i>		<i>Estimated Percolation Time mins./cm.</i>		
<i>0.140</i>	<i>0.023</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>10⁻⁵</i>		<i>30 - 35 mins./cm</i>		

GRAIN SIZE DISTRIBUTION CHART

Client: *Redstone Engineering*

Project No.: *25R103*

Project: *Ida Subdivision - Phase 2*

Location: *Ida, Ontario*

Sampled By: *Garnet Brenchley*

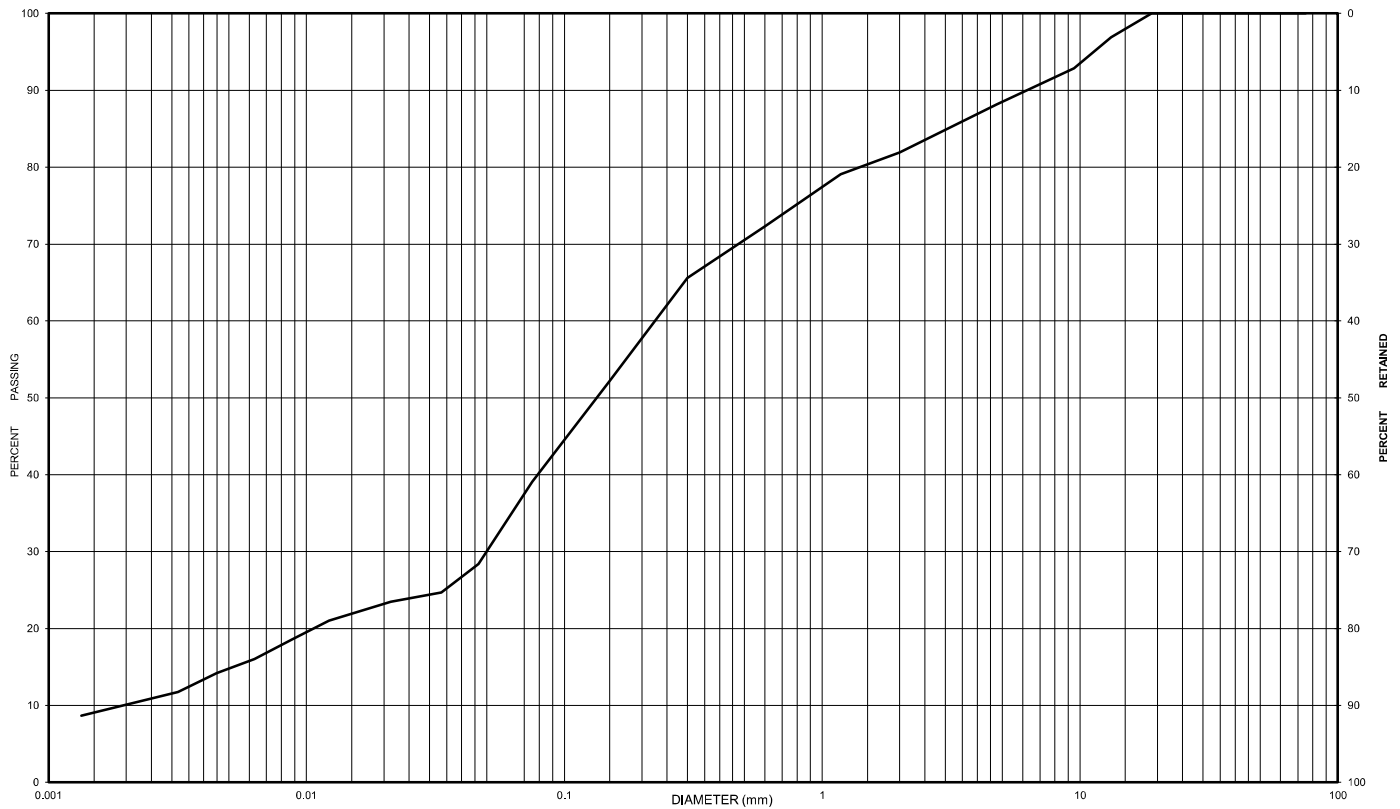
Date: *May 7, 2025*

Sample No.: *BH-2 SS-4*

Depth: *7.5 - 9.0'*

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT (<0.075mm)	SAND (<4.75 to 0.075mm)			GRAVEL (>4.75mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	VERY FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Moisture Content	Gravel	Sand	Silt	Clay	Class.
<i>BH-2 SS-4</i>	<i>7.5 - 9.0'</i>	<i>Silty SAND some gravel and clay</i>	<i>8.3</i>	<i>12</i>	<i>49</i>	<i>29</i>	<i>10</i>	<i>SM</i>

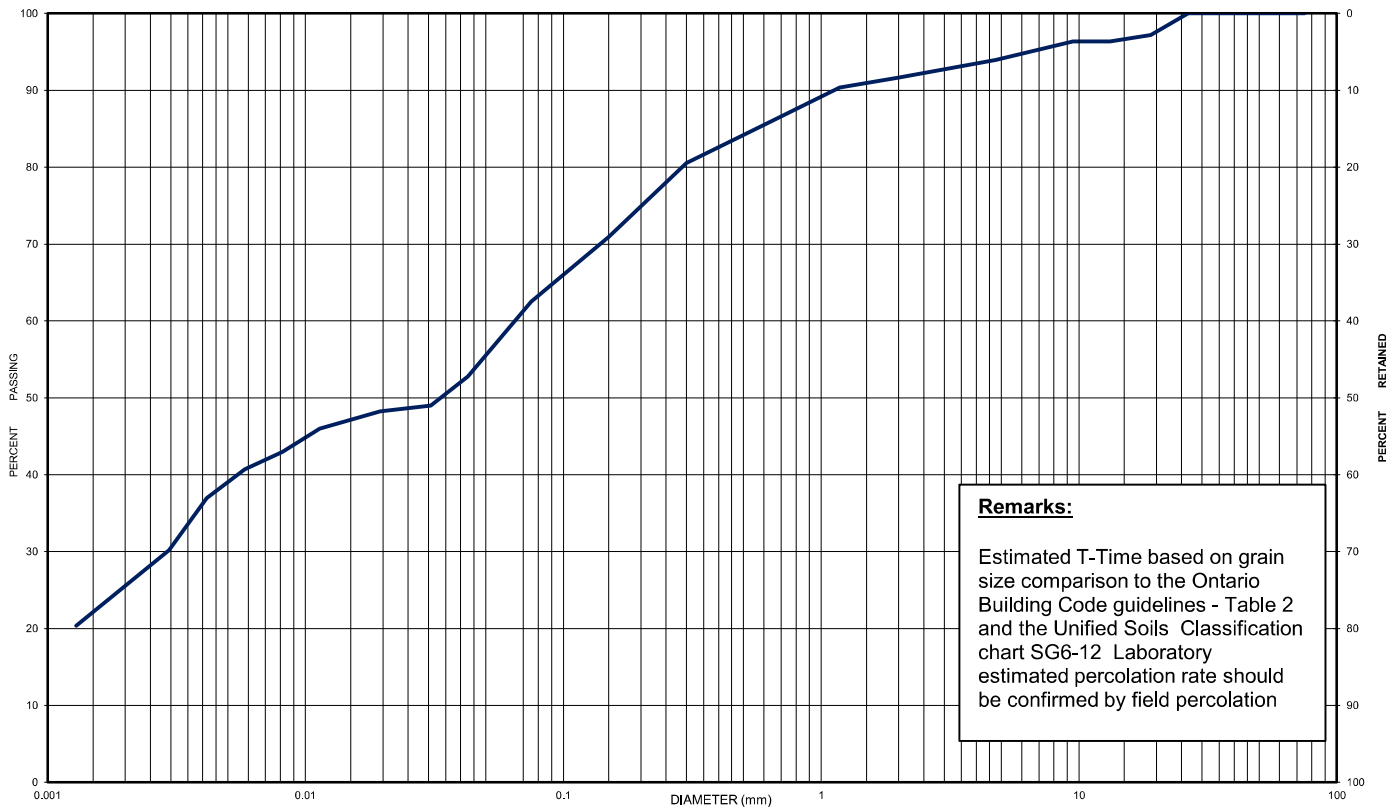
GRAIN SIZE DISTRIBUTION CHART

Client: *Redstone Engineering*
 Project: *Ida Subdivision - Phase 2*
 Sampled By: *Garnet Brenchley*
 Sample No.: *BH-3 - SS-1*

Project No.: *25R103*
 Location: *Ida, Ontario*
 Date: *May 7, 2025*
 Depth: *2.5 - 4.5'*

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT (<0.075mm)	SAND (<4.75 to 0.075mm)			GRAVEL (>4.75mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	VERY FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Description			Moisture (%)	Gravel	Sand	Silt	Clay	Class.
<i>BH-3 - SS-1</i>	<i>Sandy Clayey SILT trace of gravel</i>			<i>13.1</i>	<i>6</i>	<i>31</i>	<i>38</i>	<i>25</i>	<i>ML</i>
<i>D₆₀</i>	<i>D₃₀</i>	<i>D₁₀</i>	<i>C_u</i>	<i>C_c</i>	<i>Estimated Coefficient of Permeability</i>		<i>Estimated Percolation Time mins./cm.</i>		
<i>0.070</i>	<i>0.003</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>10⁻⁶</i>		<i>35 - 40 mins./cm</i>		

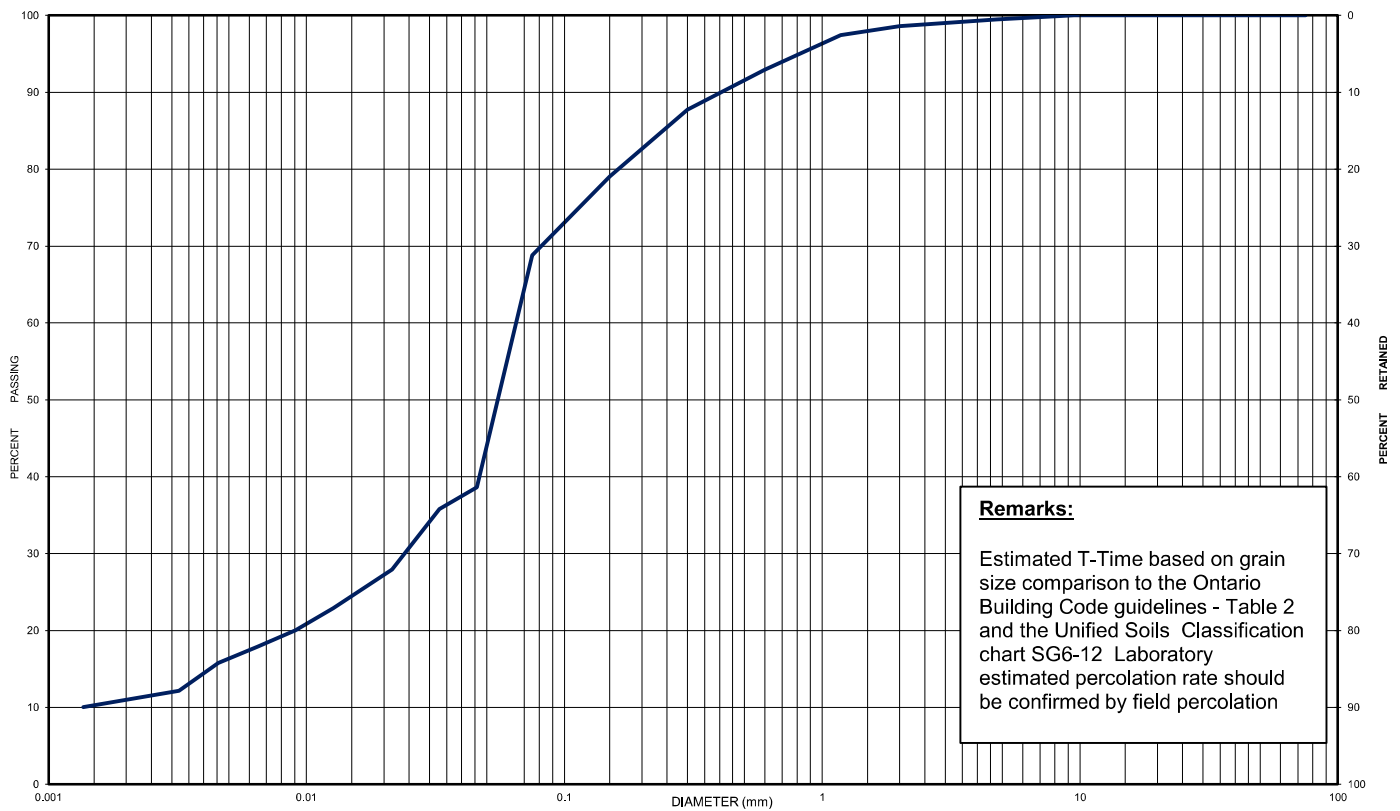
GRAIN SIZE DISTRIBUTION CHART

Client: *Redstone Engineering*
 Project: *Ida Subdivision - Phase 2*
 Sampled By: *Garnet Brenchley*
 Sample No.: *BH-5 - SS-1*

Project No.: *25R103*
 Location: *Ida, Ontario*
 Date: *May 7, 2025*
 Depth: *2.5 - 4.5'*

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT (<0.075mm)	SAND (<4.75 to 0.075mm)			GRAVEL (>4.75mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	VERY FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Description			Moisture (%)	Gravel	Sand	Silt	Clay	Class.
<i>BH-5 - SS-1</i>	<i>Sandy SILT some clay</i>			<i>27.8</i>	<i>1</i>	<i>31</i>	<i>57</i>	<i>11</i>	<i>ML</i>
<i>D₆₀</i>	<i>D₃₀</i>	<i>D₁₀</i>	<i>C_u</i>	<i>C_c</i>	<i>Estimated Coefficient of Permeability</i>		<i>Estimated Percolation Time mins./cm.</i>		
<i>0.070</i>	<i>0.025</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>10⁻⁶</i>		<i>40 - 45 mins./cm</i>		

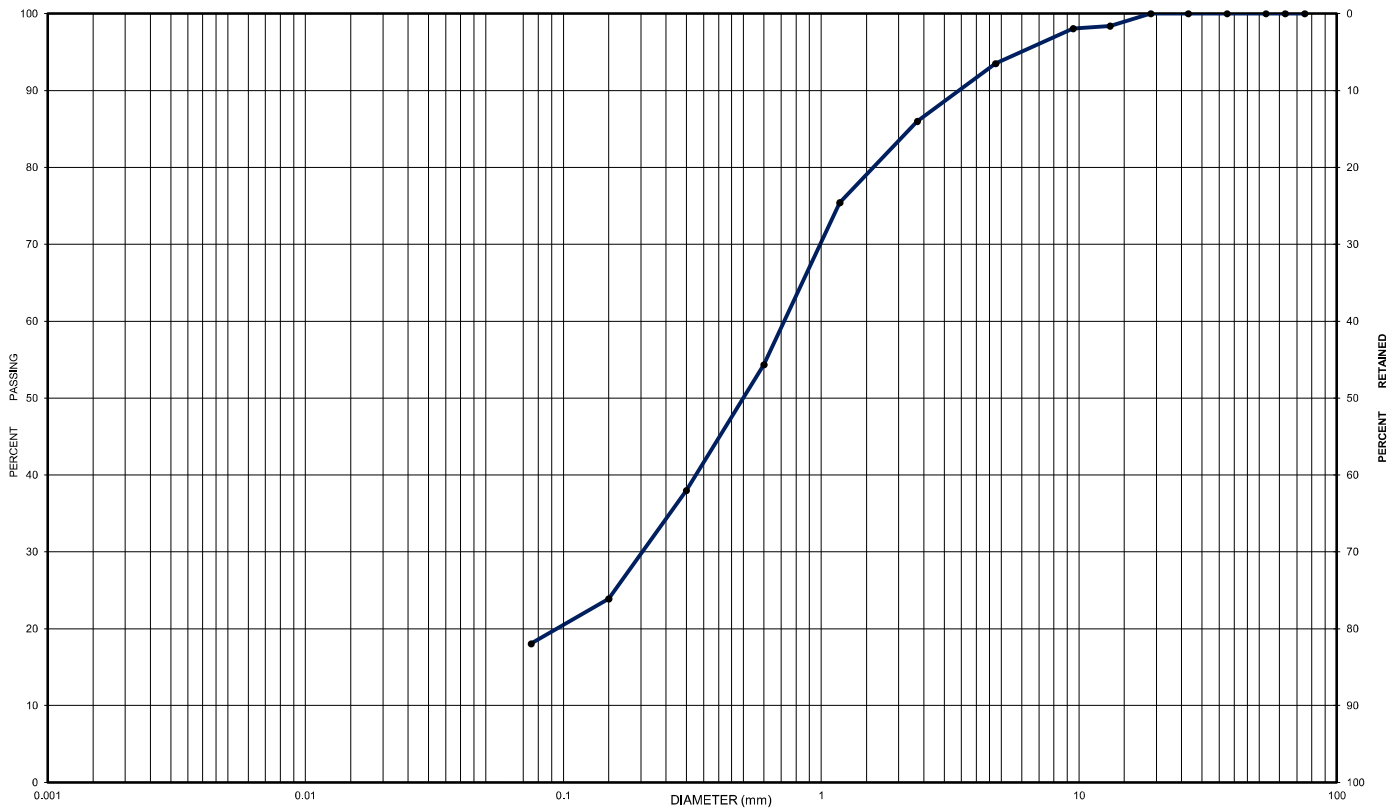
GRAIN SIZE DISTRIBUTION CHART

Client: *Redstone Engineering*
 Project: *Ida Subdivision - Phase 2*
 Sample By: *Garnet Brenchley*
 Sample No.: *BH5 SS-3B*

Project No.: *25R103*
 Location: *Ida, Ontario*
 Date: *May 7, 2025*
 Depth: *7.5- 9.0'*

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT (<0.075mm)	SAND (<4.75 to 0.075mm)			GRAVEL (>4.75mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	VERY FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Moisture Content	Gravel	Sand	Silt & Clay	Class.
<i>BH5 SS-3B</i>	<i>7.5- 9.0'</i>	SAND some silt trace of gravel	<i>9.2</i>	<i>6</i>	<i>76</i>	<i>18</i>	<i>SM</i>

GRAIN SIZE DISTRIBUTION CHART

Client: *Redstone Engineering*

Project No.: *25R103*

Project: *Ida Subdivision - Phase 2*

Location: *Ida, Ontario*

Sampled By: *Garnet Brenchley*

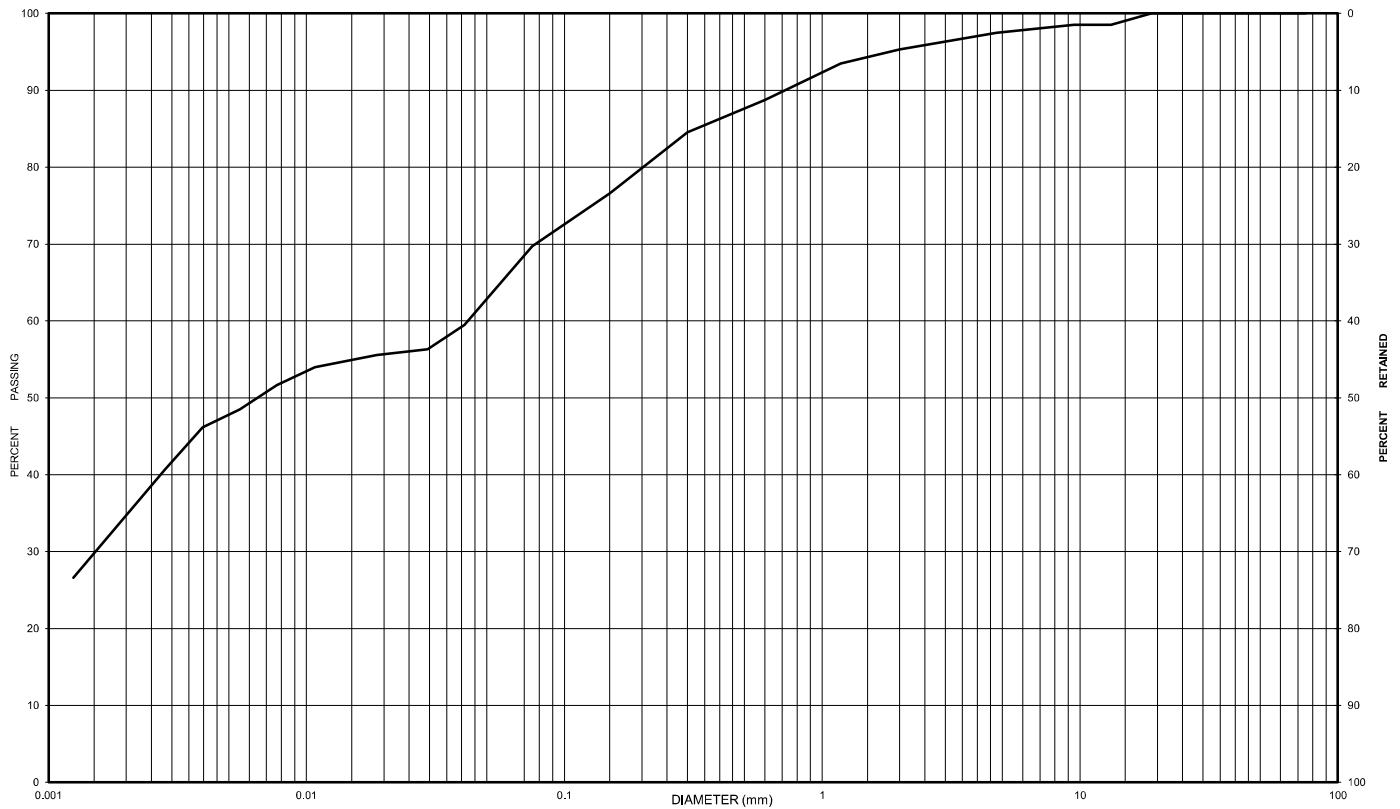
Date: *May 7, 2025*

Sample No.: *BH-7 SS-3*

Depth: *7.5 - 9.0'*

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT (<0.075mm)	SAND (<4.75 to 0.075mm)			GRAVEL (>4.75mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	VERY FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Moisture Content	Gravel	Sand	Silt	Clay	Class.
<i>BH-7 SS-3</i>	<i>7.5 - 9.0'</i>	<i>Clayey Sandy SILT</i>	<i>17.7</i>	<i>3</i>	<i>28</i>	<i>35</i>	<i>34</i>	<i>ML</i>