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Preliminary Stormwater Management & Functional Servicing Report

636040 Prince of Wales Road
DELTINI Commercial Development LTD.

July 2024

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Preliminary Stormwater Management & Functional Servicing Report

636040 Prince of Wales Road
Township of Mulmur, Primrose

1. Introduction

1.1 Appointment

The Jones Consulting Group Ltd. (TJCG) was retained by DELTINI Commercial Development LTD to provide engineering services in support of a proposed industrial development located at 636040 Prince of Wales Road, Primrose, Township of Mulmur.

This Preliminary Stormwater Management & Functional Servicing Report has been prepared to address site servicing, grading, and stormwater management in support of the *Mulmur Property Proposed Draft Plan of Subdivision*, dated February 22, 2023, prepared by The Jones Consulting Group. This report examines the property's servicing in relation to:

- Conceptual Grading
- Stormwater Management (SWM)
- Water and Sanitary Servicing
- Utility Servicing

1.2 Property Description

The site is rectangular in shape and is bound to the east by Prince of Wales Road, to the south by Highway 89 and to the north and west by Environmentally Protected lands associated with the Boyne River system. The site is in a mixed-use area in the Town of Primrose, Township of Mulmur, Ontario.

The subject property is legally described as Part of the East Half of Lot 1 and Part of the East Half of Lot 2, Concession 2, West of Hurontario Street, Township of Mulmur, County of Dufferin.

The total site area is approximately 36.99 ha including three proposed industrial blocks, one access road, one snow storage block, one stormwater management block, and approximately 8.31 ha of environmental protection area.

The site location is shown in the following **Figure 1**.

Figure 1 - Site Location

A *Proposed Draft Plan of Subdivision* for the subject lands has been prepared by The Jones Consulting Group, dated February 22, 2023, and has been attached in **Appendix A**.

1.3 Existing and Proposed Land Use

The site is currently classified as agricultural or pasture with no structures on site. The existing topography ranges in elevation from 463.3m at the central portion to 449.5m at the northwestern corner, with an average grade of 4.4%.

The western portion of the site is an environmental protection area consisting of approximately 8.4 ha of woodlot.

The developable area on the site consists of four industrial park blocks, (Block 1, Block 2, Block 3 and Block 4), one Parking & Access block for Primrose School (Block 5), one environmental protection block (Block 6), one stormwater management facility (Block 7) located in the northwestern quadrant, one Storm Pond Access and Snow Storage Block (Block 8), daylighting and 0.30m Reserves blocks (Block 9, 10, 11 & 12) and one 26 meter wide right-of-way access from Prince of Wales Road that will service the industrial Blocks 2,3 & 4. Block 1 is proposed to be accessible from Highway 89.

1.4 Supporting Documents

The following documents have been referenced in the preparation of this report:

- Nottawasaga Valley Conservation Authority – NVCA Stormwater Technical Guide, dated December 2013
- MOE Stormwater Management Planning and Design Manual, 2003
- Environmental Site Assessment – ESA, prepared by WSP, dated July 2019
- Geotechnical Testing letter, prepared by WSP, dated June 8, 2020
- Geotechnical Investigation, prepared by WSP, dated March 22, 2018
- WSP Geotech letter re. Storm Water Management Pond and Swale / Infiltration Swale Geotechnical Recommendations, dated August 03, 2023
- WSP Flood Study Report dated June 20, 2022
- WSP Letter titled Slope Erosion Hazard Assessment - Deltini Subdivision, Primrose, Ontario dated February 27, 2023
- WSP Private Servicing Feasibility Letter, dated November 10, 2023
- WSP D-5-5 Hydrogeological Investigation - Groundwater Supply, dated May 2024
- Slope Assessment, prepared by Terraprobe Inc., dated January 25, 2012
- Preliminary Stormwater Management Study – PSWMS prepared by C.C. Tatham & Associates Ltd, dated April 17, 2009
- Environmental Impact Study, prepared by Birks Natural Heritage Consultants, Inc., dated March 2021
- Water Balance Study, prepared by WSP, dated July 13, 2021.

2. Grading Concept

The grading concept for the subject lands was developed with consideration of the following:

- Reducing uncontrolled stormwater overland flow from leaving the site, and conveying the majority of stormwater runoff into the SWM facility
- Conveying the overland flow from the external southeastern catchment areas through the site to the SWM facility
- Providing positive drainage and avoiding flooding
- Considering seasonal high groundwater elevations
- Considering depth of bedrock.

Multiple iterations were carried out to arrive at the current conceptual grading and drainage design. The primary grading consideration is the boundary conditions and in particular, the roadway connection at Prince of Wales Road at the eastern boundary. The conceptual grading is based on matching the existing grade of Prince of Wales Road at approximately 460.57m and falling westerly, ending in a cul-de-sac, storm pond access & snow storage area adjacent to the SWM facility. The proposed Street "A" runs between Blocks 2, 3, 4 and 5 at a minimum grade of 0.50% in consideration of the anticipated groundwater table, projected between boreholes. West of station 0+376.68m, the road grade increases to 2.00% to reduce the earthwork fill volume required on the site and to lessen the elevation difference between the cul-de-sac and the top of pond elevation. After the road alignment passes the cul-de-sac center, the road grade changes from 2.00% to 3.00% and ends at the curb. The Street "A" is approximately 468.5m long.

Located on the far southeastern corner of Block 2, an existing culvert discharges storm drainage from the external catchment areas located east of Prince of Wales Road and north from Highway 89 to an existing ditch traversing the site. To facilitate the proposed drainage a trapezoidal open channel with 4 m flat bottom, 1 m minimum deep, 0.5m flat top of berm along south and west edges and 3:1 side slopes is proposed to convey the above mentioned external stormwater runoff towards the SWM facility and allow for the removal of the existing ditch. This open channel, also labelled as south swale, conveys all runoff from Blocks 1 and 2 at a constant grade of 0.5% from the culvert at Prince of Wales Road, westerly to the SWM facility located in Block 7. The average grade on Block 1 is 0.7% from southeast to northwest, while the average grade on Block 2 is between 0.5% and 1.0% from northeast to southwest.

Blocks 3, 4 and 5 drain from southeast to northwest at an average grade between 0.5 and 1.5%. All overland flow from this block is conveyed by a trapezoidal-shaped channel, also

labelled as north channel, with a 2 m flat bottom, 1 m minimum deep, 0.5m flat top of berm along the north edge and 3:1 side slopes, running along the northern boundary of the property at a constant grade of 0.5% to the SWM facility. This channel has been designed as an enhanced swale with four rock check dams and an underlying storage layer to promote infiltration.

Based on the geotechnical assessment of groundwater levels, bedrock depth below grade, site grading and drainage considerations, the preliminary permanent pool elevation has been set at 454.00m. The permanent pool has been designed 1.5 m deep with 7:1 sideslopes for 3m on either side of the permanent pool and 4:1 sideslopes above and below the 7:1 slope area.

The top of pond is set at 456.10 m, providing 2.10 m of active storage above the preliminary permanent pool. A minimum 5.0 m wide maintenance access road has been provided around the perimeter of the SWMF and it increases to 9.0m wide along the eastern and southern edges of the pond. The maintenance access roadway inner and outer edge elevations are 456.00m and 456.10m, respectively for 5.0m wide access road and 456.00m and 456.18m for the 9.0m wide access road.

A 3.0m wide forebay berm divides the SWM facility into two cells. The main cell is located west of the forebay berm, whereas the forebay is located to east. The top of forebay berm is set at an elevation of 454.50m and 3H:1V side slopes from top of berm to the bottom of the pond.

Along the north and west perimeter of the pond, 3:1 slopes are proposed from the outer edge of access road to the development limit, matching the existing ground.

Considering the proposed grades and seasonally high groundwater table, a pond liner will be required. The pond liner recommendations are outlined in a letter from WSP titled Storm Water Management Pond and Swale / Infiltration Swale Geotechnical Recommendations, dated 2023-08-03 and provided under separate cover. Specifics of the pond liner will be determined in the detailed design stage, following Draft Plan Approval.

The grading design aspects for the pond are in general accordance with the MOE SWM Planning & Design Manual, 2003.

Refer to the **Overall Grading Plans (GP-1 through GP-4**), the **Street 'A' Plan & Profile Drawings (PP-1 and PP-2)** and the **Industrial Road Cross Section & Drainage Easement Sections Drawing (SEC-1)**, all found in **Appendix A.**

3. Stormwater Management

3.1 Introduction & SWM Design Criteria

The intent of this stormwater management plan is to provide an environmentally sound approach to stormwater and drainage issues. The targets for the subject lands can be divided into five primary categories: quantity control, quality control, stream erosion, water balance, and erosion & sediment control. A summary of the general targets for the site is provided below in **Table 1**:

Table 1 - Stormwater Management Design Criteria

636040 Prince of Wales Road - Stormwater Management Design Criteria		
Category	**Sub-Category**	**Target**
Quantity Control	Peak Flow Control	Post-development peak flow rates must not exceed corresponding pre-development rates for the 2 through 100-Year storm events. Both the 4-hour Chicago and 24-hour SCS Type II storms must be modelled for the specified storm events *(NVCA & MOE)*
	Regulatory Storm Conveyance	Convey the Regional Event to a *sufficient outlet (NVCA)*
Quality Control	Total Suspended Soils	Provide Level 1 (Enhanced) Protection, 80% Long Term Removal *(MOE & NVCA)*
	Total Phosphorus	A minimum criteria of matching post-development phosphorus loads to pre-development levels with a 'best-efforts' preferred 20% reduction of total phosphorus from pre-development levels. *(NVCA)*
	Thermal Mitigation	Thermal Mitigation measures to meet long-term average temperature of receiving waters, *Preventative & Mitigation Techniques (NVCA, MOE & CVC)*
Stream Erosion	Runoff Volume Control Target	A minimum of the first 5mm of rainfall should be retained on site. This could be done through infiltration, rainwater harvesting or evapotranspiration. In some sites the conditions make retention of 5mm impractical. For these sites' the NVCA encourages a 'best efforts' approach to try to meet this goal. (NVCA)
	SWM Pond Outlet	Detain and release the runoff produced from the 25mm storm over a minimum 24 hours, preferred 48 hours for SWM ponds *(MOE & NVCA)*
Water Balance		Match Post-Development annual infiltration volumes to Pre-Development Levels *(NVCA)*
Erosion & Sediment Control		Protect the site from first disturbance through to reinstatement from erosion and sediment wash-off to mitigate impacts on natural systems *(NVCA)*

3.2 Existing Drainage Conditions

According to the Primrose Secondary Plan *Preliminary Stormwater Management Study* undertaken by C.C. Tatham & Associates Ltd. (April 17, 2009), three external catchment areas

located north of Highway 89 and southeast of the subject lands currently drain through the site. Two additional catchment areas were delineated to account for the drainage from Prince of Wales Road. **Drawings SWM-1** and **SWM-2**, provided in **Appendix A**, show these catchment areas.

Three existing culverts located on Prince of Wales Road discharge stormwater into the site from the external catchment areas located east of Prince of Wales Road. The stormwater runoff flows through an existing swale into a depressed ponding area located at the center of the site. From there, the storm water flows northwards, ultimately discharging to Primrose Creek.

Storm water drains uncontrolled from the central-south portion of the site towards the west and southwest, while the northern portion drains generally northwest. There is no other existing stormwater infrastructure on the site.

3.3 Proposed Drainage Conditions

The proposed stormwater management plan includes the use of an end-of-pipe extended detention wet pond, an internal roadway completed with storm sewer infrastructure and, drainage channels for conveyance of external & internal site stormwater runoff. The addition of an LID enhanced swale within the northern drainage channel will be used to promote additional infiltration. Groundwater elevations along the southern drainage channel constrain the use of a LID. Due to grading constraints, small portions of the development can not be captured and therefore discharge uncontrolled to Primrose Creek. Further consideration of LID's to meet NVCA's erosion control, phosphorus and water balance criteria is discussed in subsequent sections of this report.

The proposed lots will be developed with buildings, paved areas, and landscaped areas. Future lot development will require individual SWM plans incorporating the use of LID's to meet NVCA criteria, subject to Site Plan Control. The grading of the lots will direct stormwater runoff to the northern or southern conveyance channels. The northern and southern channels have been designed to convey major stormwater flows (up to the 100-year or Regional storm event) safely towards the proposed stormwater management facility. The internal road network will act as a division point between stormwater catchments, splitting stormwater flow directions northwards and southwards. Minor stormwater flows (5 Year event) within the road right-of-way limits will be captured and conveyed by the proposed storm sewer system. Major stormwater flows (>5 Year event) within the right-of-way limits will be conveyed by overland flow to the downstream stormwater management facility. The proposed end-of-pipe SWM facility is an extended detention wet pond equipped with a traditional forebay providing stormwater quantity and quality control functions. A subsurface cooling trench is proposed immediately downstream of

the primary outlet to treat stormwater runoff prior to discharging out to the pond outfall and Primrose Creek.

The proposed southern trapezoidal channel has a 4m wide flat bottom, 1m minimum depth and 3H:1V side slopes to convey all stormwater runoff from Blocks 1, 2, and the external catchment areas to the proposed SWMF. The channel begins at the existing culvert in the southeastern corner of the development with an invert elevation of 457.76m and runs at 0.5% for approximately 738m until intersecting the southern portion of the SWM facility at an elevation of 454.09m. At station 0+532.00 and 455.10m bottom elevation, the channel depth increases gradually until the channel's end for keeping the top of swale at a constant elevation of 456.10m, matching the top of pond and avoiding overflows during larger storm events and consequently, flooding private property.

The channel is generally located along the boundary between Blocks 1 and 2 until veering north to the SWMF, at the western limit of Block 2. A 9m wide access road is provided on the north and east side of the southern drainage channel. The access road and channel are proposed within a Drainage and Access Easement. The channel will be connected to the forebay through a culvert to be sized at the detailed design stage. The *Drainage Channel Conveyance Calculations* are provided in **Appendix B**.

A second trapezoidal channel is proposed along the northern boundary of the site to convey all stormwater from Blocks 3, 4 and 5 to the SWMF. The channel is designed with a 2m wide flat bottom, 1m minimum depth, and 3H:1V side slopes. The channel begins at an approximate elevation of 456.12m and falls westerly at 0.5% for approximately 403m until discharging into the northeastern portion of the SWM facility at an elevation of 454.11m. At station 0+204.00 and 455.10m bottom elevation, the channel depth increases gradually until the channel's end for keeping the top of swale at a constant elevation of 456.10m, matching the top of pond and avoiding overflows during larger storm events and consequently, flooding private property.

A portion of the northern channel is designed as an enhanced swale equipped with a series of 4 rock check dams at a maximum 0.30m height. The rock check dams will provide 0.30m of ponding allowing for additional infiltration. The enhanced swale includes a stone storage layer wrapped in filter cloth. A 9 m wide access road is provided on the south side of the northern drainage channel. The access road and channel are proposed within a Drainage and Access Easement. The channel will be connected to the forebay through a culvert to be sized at the detailed design stage. The *Drainage Channel Conveyance Calculations* are provided in **Appendix B**.

Primrose Creek is the receiving body for stormwater discharge from this development. Flow leaving the SWMF is proposed to be conveyed through a cooling trench for thermal mitigation and then dissipated using a flow spreader and outfall channel located on the southwestern corner of the facility. The outfall flow spreader limit matches the existing ground contour elevation of 453.00m, from where the stormwater flows into Primrose Creek through an existing slope between 2 and 5%. The proposed outfall spreader is comprised of Terrafix Flexamat erosion control mat infilled with 50mm topsoil, or approved equivalent. *Conveyance and Erosion Resistance Calculations* are provided in **Appendix B**.

The proposed SWMF has been designed to meet the quality and quantity control requirements outlined within the *MOE Stormwater Management Planning & Design Manual* (2003) and *NVCA Stormwater Technical Guide* (December 2013). Further pond design details are provided in subsequent sections of this report.

Refer to Drawing **SWM-2** in **Appendix A** for an overview of the proposed drainage conditions.

3.4 SWM Quantity Control

Peak flows were determined for pre-development and post-development conditions using the latest version of Visual OTTHYMO hydrologic modeling software (version 6.2). The site was modelled to estimate peak flows for the 2 to 100-year storm events for the SCS Type II 24-hour and Chicago 4-hour rainfall distributions as well as the Timmins Regional storm event, in accordance with the Nottawasaga Valley Conservation Authority *Stormwater Technical Guide* (December 2013). Modeling was further extended to include the 25mm 4-hour Chicago Water Quality Event as well as a continuous data set, derived from an average year's historical precipitation and temperature data. For additional information on the modeling rationale, climatology, and catchment parameters, please refer to the *Hydrology Design Writeup* located within **Appendix B**.

The preliminary design of a stormwater management facility (extended detention wet pond) was undertaken to estimate the storage volume required to attenuate post-development peak flows to the allowable pre-development rates. The stormwater management facility is approximately 2.23 hectares (ha) in size and is located within Block 7 Stormwater Management Pond in the north-western corner of the development. Refer to **Drawing GP-1, PND-1, PND-2** and **SWM-2** included in **Appendix A** for location and layout details. A wet pond design was determined to be the best fit to provide the required quantity control for the site. The proposed pond design, including the *stage-storage-discharge table* and hydrologic modeling schematics and output, are provided in **Appendix B** and **Appendix C,** respectively.

The hydrologic modeling results from the *Pre-Dev-PF* & *Post-Dev-PF* models are summarized herein. From a review of the model output, it was determined that the 24-Hour SCS Type II Storm distribution would govern for Volume and generally for Peak Flow Control. The post-development runoff peak flow rates summarized in the following results table have been extracted at the *Outfall Node* of the overall catchment, which considers both controlled (pond outflow) and uncontrolled peak flows. Refer to the OTTHYMO *Pre-Dev-PF* and *Post-Dev-PF* model results in **Appendix C.**

Table 2 – SWM Quantity Control Results

Single Event Duration Storm Peak Event Flow (m^3/s)							
Storm Distribution	**Area (ha)**	**Return Period (years)**					
		2	**5**	**10**	**25**	**50**	**100**
Pre-Development Condition							
CHI 4-Hr Storm Distribution	43.64	0.494	0.697	0.843	1.067	1.247	1.424
SCS 24-hr Storm Distribution	43.64	0.681	1.146	1.496	2.057	2.469	2.921
25mm 4hr Chicago Storm	43.64	0.244					
Timmins Regional Storm	43.64	2.658					
Post-Development Condition (with attenuation)							
CHI 4-Hr Storm Distribution	43.64	0.038	0.147	0.188	0.315	0.515	0.694
SCS 24-hr Storm Distribution	43.64	0.153	0.346	0.678	1.033	1.245	1.441
25mm 4hr Chicago Storm	43.64	0.026					
Timmins Regional Storm	43.64	2.331					

The results demonstrate that the proposed stormwater management facility will provide the required quantity control to reduce post-development peak flows to below pre-development release rates.

For the future individual Site Plan developments, it should be demonstrated that the total proposed site imperviousness is less than 70% to conform with the SWM Pond quantity control design. Quantity control requirements should be reviewed with approval authorities on a site-by-site basis, subject to Site Plan Control.

3.5 SWM Quality Control

The SWM Quality Control is divided into three subsections:

- Total Suspended Solids (TSS),
- Total Phosphorus (TP),
- and Thermal Mitigation.

3.5.1 Total Suspended Solids (TSS)

The "Enhanced" level of protection as stipulated by the Ministry of Environment is to be provided, i.e. 80% removal of Total Suspended Solids (TSS) from 90% of the annual runoff volume.

These requirements are achieved via the use of a proposed end-of-pipe stormwater management extended detention wet pond. Additional future LIDs provided within the site plan design stage will assist to further increase the overall TSS removal efficiency for the subdivision through a treatment train approach.

For the future individual Site Plan developments, it is recommended that Site Plans incorporate quality control treatment for removal of Total Suspended Solids (TSS) closer to the source of stormwater runoff generation. Quality control requirements should be reviewed with approval authorities on a site-by-site basis, subject to Site Plan Control.

3.5.2 Total Phosphorus

The NVCA's minimum criteria is to match post-development phosphorus loads to pre-development levels with a 'best-efforts' preferred 20% reduction of total phosphorus from pre-development levels.

Pre & Post-development Total Phosphorus loadings were determined using a weighted average approach. EMC values were referenced from the Low Impact Development Treatment Train Tool - Release Notes: Land Cover EMC's, which has been provided in **Appendix B** for ease of reference. The Continuous *Pre-Dev-LID* and *Post-Dev-LID* OTTHYMO models were referenced and used to establish Annual Pre-Development and Post-Development Total Phosphorus loadings. Please refer to the *LID Performance Summary*, *Pre-Development Total Phosphorus Mass Balance Calculation*, and the *Post-Development Total Phosphorus Mass Balance Calculation* provided in **Appendix B**.

The extended detention wet pond provides 63% phosphorus removal rate, assisting in meeting the NVCA design criteria as an end-of-pipe facility within a treatment train approach. An additional 27% is indirectly credited to the Enhanced Swales LIDs due to the reduction of stormwater runoff exiting the facilities via infiltration. In total, a 64.3% removal of total phosphorus has been achieved which satisfies NVCA's minimum criteria to match pre- and post-development phosphorus loads. It is worth noting that the current design achieves an overall 18.7% reduction of total phosphorus from pre-development levels. **For future individual Site Plan developments, it is recommended that Site Plans incorporate quality control treatment for removal of Total Phosphorus (TP) closer to the source of stormwater runoff generation.**

Quality control requirements should be reviewed with approval authorities on a site-by-site basis, subject to Site Plan Control. This is typically achieved via at-source infiltration-based SWM facilities and Low Impact Development. Infiltration-based LID's provide further quality control of stormwater runoff by removing pollutants upstream of the pond.

3.5.3 Thermal Mitigation

The following mitigation measures have been recommended in the *Environmental Impact Study* prepared by Birks Natural Heritage Consultants Inc dated March 2021. The efforts are intended to further reduce the potential impacts to wetlands and fish habitats, specifically relating to potential thermal impacts to the receiving Primrose Creek watercourse.

- Bottom draw outlets in SWM pond,
- Cooling trenches installed in SWM pond,
- Subsurface Trench Outlets,
- Shading of the pond's permanent pool, outfall channel, and paved surfaces in the catchment area and,
- Improved SWM pond design (e.g., selecting location and orientation to minimize sun exposure, increasing length-to-width ratio, and application of planted berms within the pond).

To address the mitigation measures proposed above, a cooling trench is being designed along the western outer embankment of the SWM facility, measuring 3.0m in width, 96.0m in length and 1.3m in depth, setting its bottom and top elevation at 253.00m and 254.30m, respectively.

The trench is completed with two 100.0m long, 200mmØ perforated PVC pipes wrapped in filter fabric, surrounded by pea gravel wrapped in Terrafix 270R. The pipes are graded at 0% slope and their inverts set at 453.30m and 453.80m, being connected to maintenance holes located at the trenches end, which provide flow control and maintenance access.

The water is drawn by a 300mmØ reversed PVC pipe from the plunge pool bottom at 451.50m to the primary orifice plate bolted on the control MH, with the invert set at the same elevation as the permanent pool, 454.00m. This primary orifice is designed to discharge the 25mm 4hr Chicago event (WQE) at a continuous rate into the cooling trench.

From the control MH, the Water quality event (WQE) is conveyed by a 150mmØ PVC pipe into the first maintenance hole, and flows into the upper perforated PVC incoming pipe, while the lower perforated PVC outgoing pipe remains blocked by a mechanical plug. From the upper perforated pipe, the water infiltrates into the trench and cools down while transferring heat to the pea gravel.

The lower perforated pipe conveys the cooled water into the second maintenance hole, where a gate valve is installed at the upper perforated pipe's end and closed during normal operation. Next, the cooled water is conveyed by a 450mmØ PVC pipe to the north headwall (HW 06) within the outfall spreader area, where it is finally discharged on the existing ground and drains to Primrose Creek. There is also a bypass route from the control maintenance hole to cooling trench outlet maintenance hole consisting of two 450mmØ PVC pipe with a maintenance hole in between for higher outflow rates.

For more details, refer to Pond Plan View and Pond Sections on **Drawings PND-1** and **PND-2**, respectively, both included in **Appendix A.**

Additional details will be addressed during the detailed design stage, after Draft Plan approval.

3.6 Low Impact Development Measures & SWM Erosion Control

The subject lands applicable to this report will include a suite of Low Impact Development (LID) source and conveyance control measures, to provide controls that reduce peak flows & runoff volumes, provide upstream treatment for contaminants, promote groundwater recharge, and aid in maintaining water balance to pre-development levels.

A number of constraints have also been identified within the subject lands which limit the implementation of LID measures, the largest of which is the difference between the finished grade surface and the existing groundwater table elevations.

Table 3 – LID Site Specific Constraints

Factor	Site Specific Constraint
High Groundwater	High Groundwater identified throughout the majority of the subject lands by Geotechnical Investigation and Groundwater Monitoring.
Zoning & Land Use Requirements	Limited land use available for centralized infiltration based LID practices.
Excessive Costs	Cost of fill required to increase proposed grades to elevations required to provide infiltration based practices unfeasible.
Poor Soils	Geotechnical investigation yielded results with soils having poor infiltration potential (K<15 mm/hr) throughout the subject lands

Future individual lot development will require exploring site-specific conditions for LID opportunities to meet the NVCA's Erosion Control Criteria of providing 5mm of infiltration volume over the development area. Our investigation and review of background reports shows generally favorable infiltration rates and the site plan layout and grading of future individual development blocks may allow for the calculated siting of Low Impact Development measures

where required separation can be achieved to the seasonally high groundwater elevations encountered locally throughout the site.

The following targets were established for Erosion Control Criteria, based on guidance provided in the *NVCA Stormwater Technical Guide:*

Table 4 - Runoff Volume Control Targets

Runoff Volume Control Targets (RVCt)	
RVCT	5 mm
Area	3.72 ha
RVCT	186 m^3

Given that the individual Industrial Block developments and Primrose Parking & Acess (totaling 24.96 ha) will need to provide their own 5mm RVCT, the remaining developable area (28.68 ha – 24.96 ha = 3.72 ha) is considered for this report.

The LID measures proposed have been carefully selected, sited and designed based on the proposed development's characteristics and site-specific constraints identified in **Table 3.** The Post-Development Storm Drainage plan (**Drawing SWM-2**) illustrates the proposed drainage scenario and can be found in **Appendix A**.

The LIDs are designed as dry swales with bioretention layers underneath, located along the North Channel. Each one is 60m long, 2.0m wide and 1.0m deep, except for the most upstream LID, which is 0.60m deep due to a local high groundwater table constraint. The first LID is comprised of 50mm thick hardwood mulch, 100mm thick pea gravel choker layer with 10mmØ washed clear stone and 450mm thick storage layer with 50mmØ washed clear stone, totaling 600mm of depth. All other 3 downstream LIDs are comprised of 50mm thick hardwood mulch, 550mm thick engineered soil media blend 'B' (3 parts of sands, 2 parts of topsoil and 1 part of sand & organic content), 100mm thick pea gravel choking layer with 10mmØ washed clear stone and 300mm thick storage layer with 50mmØ washed clear stone, totaling 1000mm of depth. The LID sections are illustrated on the Industrial Road Cross Section & Drainage Easement Sections (**Drawing SEC-1**) included in **Appendix A**.

The subsurface and surface storage volume provided in the proposed LID Enhanced Swales is estimated to respectively be 172.8 m^3 and 93.6 m^3, totaling **266.4** m^3 of storage volume and achieving the required RVCT. The subsurface and surface storage volumes are calculated based on the LID's geometry and porosity as illustrated on **Table 5** below:

Table 5 – LID Storage Volume

Subsurface storage			
LID #	**Area (m^2)**	**Depth (m)**	**Volume (m^3)***
1	120	0.6	28.8
2	120	1.0	48.0
3	120	1.0	48.0
4	120	1.0	48.0
Total			**172.8**
* All sand and stone layers assumed to have 40% porosity			
Surface storage			
LID #	**Volume 1 (m^3)****	**Volume 2 (m^3)*****	**Volume (m^3)**
1	18	5.4	23.4
2	18	5.4	23.4
3	18	5.4	23.4
4	18	5.4	23.4
Total			**93.6**
** Volume over 2m bottom calculated as follow: LxWxD/2 = 60*2*0.3/2			
*** Volume over sloped banks calculated as follow: LxWxD/3 = 60*0.9*0.3/3			
Subsurface and surface storage volume combined (m^3)			**266.4**

Furthermore, as Primrose Creek (part of the Boyne River system) is deemed sensitive, erosion control is required to ensure that the post-development peak flow from the 25mm storm event is released over a 48-hour period. The pond's primary orifice has been sized to provide a 52.5 hour and 70.2 hour drawdown time for the 25mm 4 hour Chicago water quality event and extended detention water quality volume, respectively. Please refer to the *SWMF Stage-Storage-Discharge Table* and *SWMF Quality Design Notes* located in **Appendix B** for additional details.

3.7 Water Balance

The primary objective of the NVCA's water balance target is to capture and manage annual rainfall on the development site to preserve the pre-development hydrology (water balance) through a combination of infiltration, evapotranspiration, absorbent landscaping, rainwater reuse and/or other LID practices. Various site-specific characteristics contribute to the ability to achieve water balance. They include, but are not limited to: soil permeability, the ability to collect and direct drainage into the ground, groundwater table elevations and seasonal fluctuations. Best efforts will be made via the SWM Plan to maintain groundwater recharge while considering site specific characteristics.

A site-specific water balance has been completed by WSP and detailed in the *Water Balance Study* dated July 13th, 2021. WSP completed a pre- to post-development water balance to

estimate the infiltration volume deficit that would need to be mitigated via the proposed SWM Plan. The infiltration and runoff volumes as calculated in the WSP Water Balance Study are presented in **Table 6** below.

Table 6 - Summary of Water Balance Calculations by WSP

Water Balance Runoff & Infiltration Volumes – WSP Table A-5			
	Pre-Development	**Post-Development**	**Difference**
Impervious Area Runoff Volume (m^3/a)	4,429	179,267	+174,838
Pervious Area Runoff Volume (m^3/a)	76,917	31,715	-45,202
Total Runoff Volume (m^3/a)	81,347	210,982	**+129,635**
Total Infiltration Volume from Pervious Surfaces (m^3/a)	98,266	43,018	**-55,248**

The results summarized in the table above indicate that there is an increase in total runoff volume and a deficit in infiltration volume from pre- to post-development without accounting for LID's. The SWM Plan herein is intended to mitigate or reduce the water balance deficit as outlined above. Runoff generated from part of this development is directed to the proposed Low Impact Development (LID) measures (Enhanced Swales). The LID's and their contributing drainage areas are shown on **Drawing SWM-2** in **Appendix A.**

Future LID's within the individual blocks will be incorporated to assist with mitigating the infiltration deficit. **Subject to Site Plan Control, future block developments will need to provide their own respective water balance analysis and mitigation, using factors and inputs consistent with WSP's Water Balance Study.**

Reviewing the results of the *Post-Dev-LID (Continuous)* model simulation, the model predicts that approximately **9.7%** of the annual runoff generated from the site is captured and retained by the proposed LID practices. The 9.7% capture of annual runoff volume is applied to the total post-development runoff volume (210,982 m^3/a per WSP's calculations) and equates to approximately **20,465 m^3/a**. This additional infiltration volume is added to the post-development infiltration volume occurring naturally, determined through WSP's calculations, increasing the site's post-development infiltration from **43,018 m^3/a** to **63,483 m^3/a.** The revised annual infiltration volume is estimated to be **63,483 m^3**, reducing the post-development infiltration deficit from **55,248 m^3** to **34,783 m^3** annually.

In summary, the proposed stormwater management plan has undertaken a best-efforts approach to mitigate the established pre- to post-development water balance targets for development of the subject lands. **Future Development of the industrial blocks will provide the remaining water balance mitigation volume through implementation of LID's, subject to Site Plan Control.** Given a total industrial block and Primrose Parking and Access areas for

the proposed development of 24.96 ha, and the respective water balance analysis completed by WSP, the estimated annual water balance infiltration volume required for mitigation is approximately **1,394 m³/ha** of development area.

3.8 Erosion and Sediment Control

During construction, the majority of the development's natural features will be removed and the topsoil stripped within the development area. The exposed surface will be susceptible to erosion, increasing the potential for sediment runoff. To minimize local and downstream impacts from erosion and sedimentation during construction, the following measures are recommended:

- Excess earth and topsoil is to be stockpiled away from the creek limits and/or removed from site. Stockpiles shall be seeded or covered with erosion control if left for periods of greater than 30 days.
- Temporary sediment control fencing should be erected around the perimeter of all grading activities;
- Temporary sediment fabric and stone filters should be installed on catch basins until surface cover has been stabilized;
- Temporary rock flow check dams should be installed within drainage cut-off swales;
- A temporary construction access mud mat should be installed at the construction accesses to reduce the amount of materials that may be transported off site;
- Temporary erosion and sediment control basins are to be constructed, complete with a Hickenbottom outlet control structure and overflow weir. The basins' purpose is to detain runoff long enough to allow the majority of soil particles to settle out of suspension;
- Construction during drier months should be monitored for wind-borne transport of sediments. At the direction of the engineer, the contractor may be directed to water down exposed earth areas with an aqueous solution of calcium chloride.
- All disturbed areas not under immediate construction for 30 days, or not intended for building activities within a 3-month time period, should be stabilized with seeding.
- Phased removal of temporary sediment basins during building phase of the development to coincide with upstream stabilization (established vegetation) of catchment areas.
- A weekly monitoring program to ensure all ESC measures are in place and not damaged by vandalism or a significant storm event.

Erosion and Sediment Control Plans (ESC Plans) to identify the location and details of the temporary devices will be required prior to site alteration works commencing.

4. Sanitary Servicing

There is no existing sanitary sewer system within or adjacent to the proposed industrial development. Thus, according to the *Private Servicing Feasibility Study* by WSP, dated November 10, 2023, the sanitary servicing option consists of multiple decentralized private onsite sewage treatment and subsurface disposal systems.

The sanitary sewage based on the overall size and use of each individual lot is expected to be less than 10,000 L/d, which would be approved under the Ontario Building Code (OBC), and the theoretical daily sewage flow for the proposed buildings can be based on Table 8.2.1.3.B of the OBC.

It is expected that the primary source of wastewater from the commercial development will consist of bathroom facilities and should be similar to domestic strength wastewater. If the industrial applications result in a higher risk of wastewater strength and exceeds domestic levels, alternative treatment systems will be considered at the detailed design stage.

For the expected level IV treatment system requirement, a raised type A dispersal bed is preferred and consists of a soil absorption system, combining layers of stone on top of sand layers, installed in or on native soil. For more information on the design, dimensions and parameters used on the sanitary sewer servicing and treatment, refer to the *Private Servicing Feasibility Study* by WSP, dated November 10, 2023, provided under separate cover.

5. Water Servicing

There are no existing municipal drinking water services located in the vicinity of the subject lands at this time. As such, individual private wells will service the development lots located on the subject lands.

The Township provided comment that the supporting hydrogeological study for the site be updated to comply with MOE D-5-5. This required a water supply assessment for existing and new wells on the site, checking for available groundwater supply and groundwater quality. A total of nine (9) new wells were drilled on-site, and are shown on the engineering plans. Refer to the D-5-5 Hydrogeological Investigation – Groundwater Supply completed by WSP Canada Inc., dated May 2024, provided under separate cover for details on groundwater quantity & quality and guidance on potential land uses within the proposed subdivision.

5.1 Communal Fire Flow Storage

Arising from discussion during the Pre-Consultation meeting, the Town has requested that an option be examined for the provision of a communal water tank for fire flow storage to explore

cost-sharing opportunities. In order to provide a solution for the required fire flow capacity for the proposed development, a conceptual communal water storage tower was sized based on recommendations taken from the MOECP Design Guidelines for Drinking Water Systems. The proposed fire suppression system consists of a minimum 342,000L storage tower providing flow to approximately 475m of watermain located within 'Street A'. The proposed system consists of 5 hydrants located along 'Street A'. The estimated cost for the works is $2,250,200.

Given that the subdivision is in its preliminary stages, specific land uses for the future industrial lot developments are unknown. As such, storage tower volume calculations were made based on conservative assumptions regarding water demand and population.

Fire flow storage calculations and a cost estimate in **Appendix D**.

After reviewing the option of providing a communal water tank and distribution system for fire suppression, it is our recommendation that this option be dismissed based on the following:

- The cost of the system would represent a large up-front cost for the developer.
- Individual lot developments will already have to provide their own well and tank for potable water supply and other site-specific uses. For the individual lot developers, the cost of up-sizing these systems for fire suppression would likely be less than their share of the cost of the communal system.
- A large factor in the calculations is the building size. Given that the future site-specific land uses are unknown, the building is assumed to be as large as the allowable building envelope.

6. Utilities

The utility providers for the development are Enbridge Gas, Hydro One, Bell Canada and Rogers Cable.

There is existing overhead hydro on the south side of Highway 89, and along east side of Prince of Wales Road. Existing communication infrastructure exists along Highway 89 and north along a portion of Prince of Wales Road.

At the time of report issuance the extent of gas infrastructure in the area has yet to be confirmed.

Utility Servicing coordination for the site will been undertaken during the detailed design stage of the project.

7. Conclusion & Recommendations

This Preliminary Stormwater Management and Functional Servicing Report identifies the recommended servicing, grading and stormwater management design strategies in support of the proposed industrial development at 636040 Prince of Wales Road, Primrose, Township of Mulmur.

This Report, in conjunction with the other supporting documentation, demonstrates that the development as proposed on the *Draft Plan of Subdivision*, dated February 22, 2023, prepared by The Jones Consulting Group Ltd. can be adequately serviced.

In particular, this Report has recommended the following:

- Construct an internal urbanized roadway and below grade (5yr) storm sewer system to convey all storm events up to and including the 100yr event.
- Full movement vehicular access from Prince of Wales Road for Blocks 2 and 3. Full movement access from Highway 89 for Block 1.
- Two (2) trapezoidal east-to-west drainage channels including 9.0m wide maintenance access roadway, straddling the boundary between Blocks 1 and 2, and along the northern limit of Block 3, to collect and convey storm drainage to an end-of-pipe extended detention wet pond.
- One (1) end-of-pipe extended detention wet pond including a minimum 5.0m wide and maximum 9.0m wide maintenance access roadway to achieve both quantity and quality control requirements for the site.
- Future Site Plan specific LID's for the individual block developments to achieve the minimum NVCA erosion control, water balance and phosphorus criteria.
- Implementation of erosion and sediment controls to mitigate local and downstream impacts during construction; until development is adequately vegetated/built out.
- Individual water wells and septic treatment facilities are required on a Site Plan specific basis to achieve domestic and fire protection as well as sewage treatment.
- Coordinate with Hydro, gas, and communication providers to extend/upgrade existing infrastructure on surrounding roadways to accommodate the proposed development.

Respectfully Submitted,

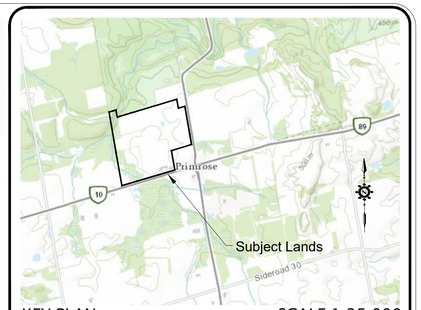
The Jones Consulting Group Ltd.

Appendix A

Engineering Drawings

- Proposed Draft Plan of Subdivision by TJCG, dated February 22, 2023
- GP-1 Overall Grading Plans
- GP-2 Overall Grading Plans
- GP-3 Overall Grading Plans
- GP-4 Overall Grading Plans
- STM-1 Storm Drainage Plan & Storm Sewer Design Sheet
- PP-1 Plan & Profile Street 'A' STA 0+000 TO 0+240
- PP-2 Plan & Profile Street 'A' STA 0+240 TO 0+525
- SEC-1 Industrial Road Cross section & Drainage Easement Sections
- PND-1 Pond Plan View
- PND-2 Pond Sections
- SWM-1 Strom Water management Plan Pre-Development Conditions
- SWM-2 Storm Water Management Plan Post-Development conditions

Watercourse
Meander Belt Width
6m Buffer of Meander Belt Width
Regional Floodline Existing Conditions
6m Buffer of Regional Floodline Existing Conditions
Overland Flow Route



KEY PLAN SCALE 1:25,000

Draft Plan of Subdivision

Part of the East Half of Lot 1 And,
Part of the East Half of Lot 2,
Concession 2,
West of Hurontario Street
Township of Mulmur, County of Dufferin
2023

OWNER'S CERTIFICATE

I, THE UNDERSIGNED, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE THE JONES CONSULTING GROUP LTD., TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND TO SUBMIT SAME TO THE TOWNSHIP OF MULMUR FOR APPROVAL.

DATE

636040 Prince of Wales Road:
Deltini Commercial Developments Inc.
506249 Highway 89: Deltini (Mulmur) Inc.
506243 Highway 89: Deltini (Primrose) Inc.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE RUDY MAK, OLS

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

a) SHOWN ON DRAFT PLAN
b) SHOWN ON DRAFT PLAN
c) SHOWN ON KEY PLAN
d) INDUSTRIAL, EP & SWM
e) SHOWN ON DRAFT PLAN
f) SHOWN ON DRAFT PLAN
g) SHOWN ON DRAFT PLAN
h) MUNICIPAL PIPED WATER TO BE PROVIDED
i) SANDY/CLAY LOAM
j) SHOWN ON DRAFT PLAN
k) ALL MUNICIPAL SERVICES TO BE PROVIDED
l) SHOWN ON DRAFT PLAN

STATISTICS	AREA (ha.)
Industrial Blocks (BLOCKS 1 - 4)	24.42 ha.
Primrose Parking & Access (BLOCK 5)	0.54 ha.
Environmental Protection (BLOCK 6)	8.31 ha.
Stormwater Management (BLOCK 7)	2.23 ha.
Snow Storage (BLOCK 8)	0.12 ha.
Daylighting and 0.3m Reserves (BLOCK 9 - 13)	0.03 ha.
Road (STREET 'A')	1.34 ha.
TOTAL	36.99 ha.

SCHEDULE OF REVISIONS

DATE	DESCRIPTION	DRAWN
OCT. 20/2020	REVISIONS AS PER COMMENTS	m.c.r.
JAN. 11/2021	REVISIONS AS PER ENG COMMENTS	m.c.r.
MARCH 22/2021	REVISIONS OLS	m.c.r.
APRIL 1/2021	ADD ENVIRONMENTAL LINEWORK FROM WSP	m.c.r.
APRIL 15/2021	UPDATE ENVIRONMENTAL LINEWORK LABELS	m.c.r.
APRIL 29/2021	UPDATE EASEMENT AS PER ENG REVISION	m.c.r.
JUNE 2/2021	NEW BDY FROM OLS/UPDATE DP ACCORDINLY	m.c.r.
DEC. 23/2022	NEW BIRKS LINEWORK/REVISE SETTLEMENT BNDY TO OP	m.c.r.
JAN. 31/2023	NEW BIRKS LINEWORK/REVISE SETTLEMENT BNDY TO OP	m.c.r.
FEB. 7/2023	NEW ENG SWM POND LAYOUT/SCHOOL PARKING BLK	m.c.r.
FEB. 15/2023	PREP FOR SUBMISSION	m.c.r.
FEB. 22/2023	ADD NEW EASEMENTS/FINALIZE FOR SUBMISSION	m.c.r.

0 10 50 100M
SCALE 1 : 1250 (A1)

MULMUR PROPERTY

PROPOSED DRAFT PLAN OF SUBDIVISION

Raymond J. Duhamel
REGISTERED PROFESSIONAL PLANNER
R.P.P.

Date Issued:	JULY 9, 2020
Checked By:	RD
Project No.:	FRE-17110
Drawn By:	m.c.r.
Drawing Name:	FRE-17110-DP-2.dwg

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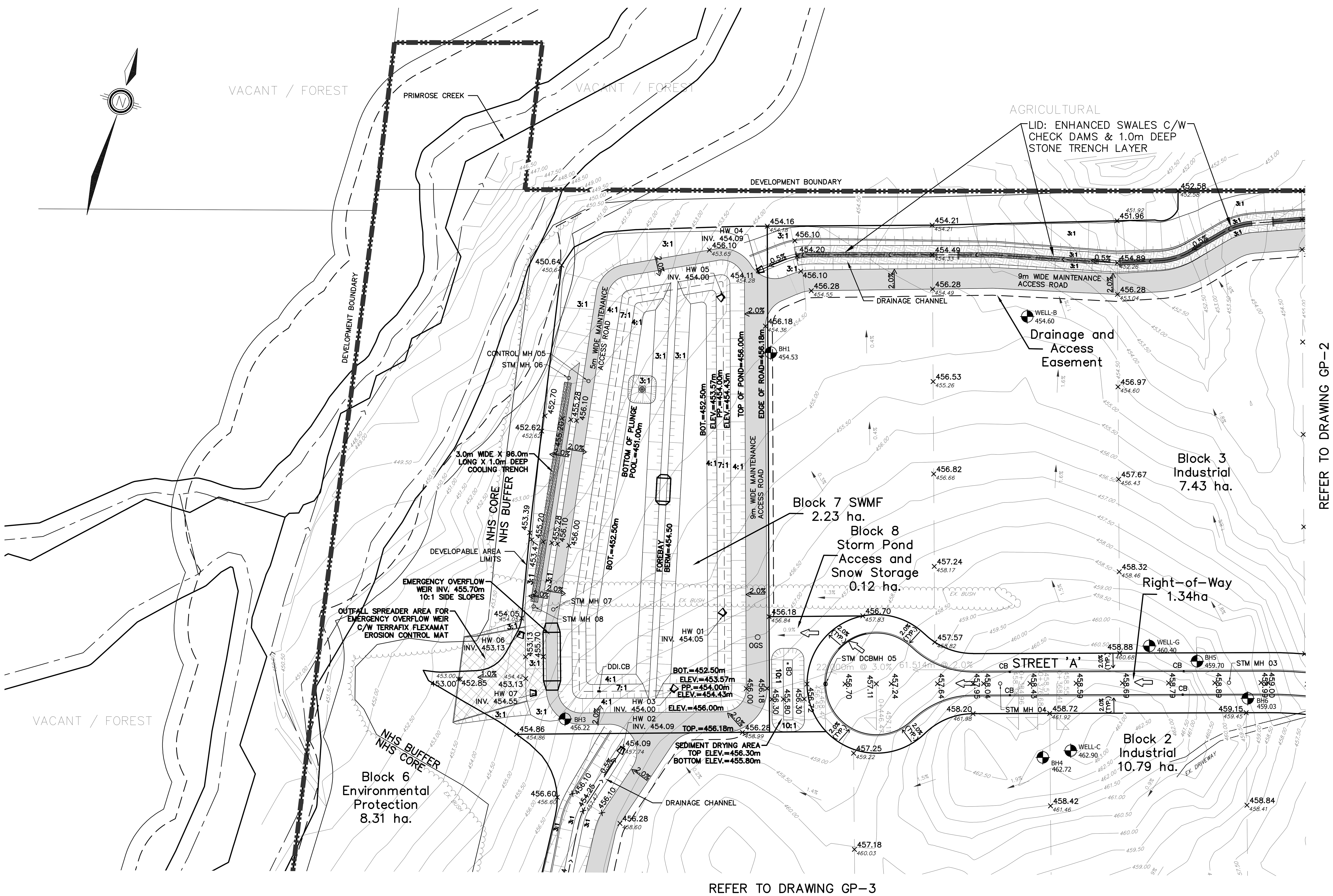
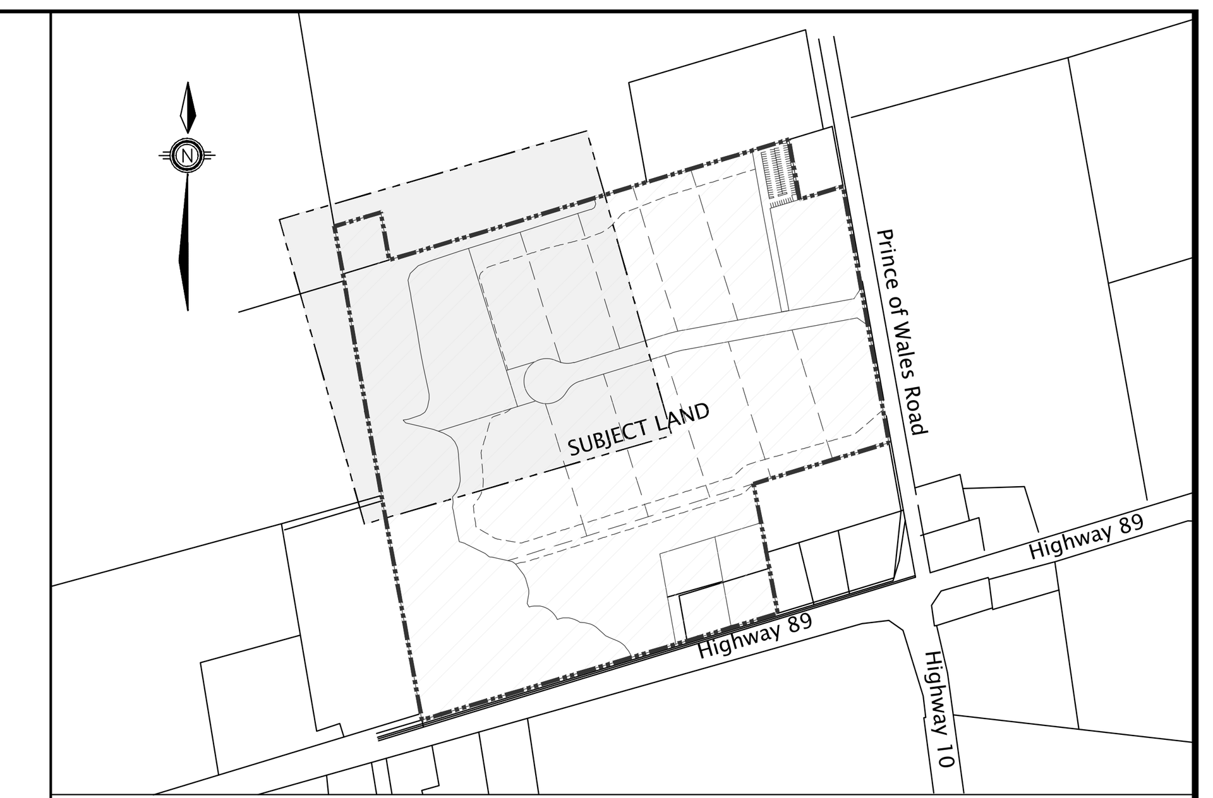
Phone: 705-734-2538 Fax: 705-734-1056
www.joneconsulting.com

DRAFT PLAN OF SUBDIVISION

HAMLET OF PRIMROSE, TOWNSHIP OF MULMUR





KEY PLAN
NTS

LEGEND

	LIMIT OF SUBDIVISION
260.00	EX. CONTOUR AND ELEVATION
	EX. DITCH
STM 01	PROP. STM MH
STM DCBMH 05	PROP. STM DOUBLE CATCHBASIN
CB	PROP. STM CATCHBASIN
	SLOPE (3:1 MAX.)
BH4 462.72	EX. BOREHOLE LOCATION ID# & GROUNDWATER ELEVATION
WELL-C 462.90	WATER SUPPLY WELLS
	MAJOR OVERLAND FLOW ROUTE
	GRADE CHANGE FLAG
24.110m @ 4.0%	℄ ROAD LENGTH & GRADE
456.94	PROPOSED ELEVATION
460.14	EXISTING ELEVATION
	DRAINAGE CHANNEL ℄
	EX. DITCH
	WATERCOURSE
	MEANDER BELT WIDTH
	6M BUFFER OF MEANDER BELT WIDTH
	REGIONAL FLOODLINE EXISTING CONDITIONS
	6M BUFFER OF REGIONAL FLOODLINE EXISTING CONDITIONS

BENCHMARK:
ELEVATIONS ARE GEODETIC AND ARE DERIVED BY REAL TIME OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83 (CSRS)(2010).

NO.	REVISIONS	DATE	INITIAL
4.	2nd SUBMISSION FOR DPA & ZBLA	JUL 2024	MF
3.	SUBMITTED FOR DPA & ZBLA	MAY 2021	MF
2.	PRELIMINARY FSR/SWMR	AUG 2020	MF
1.	CONCEPTUAL DESIGN	MAY 2020	MF

LICENSED PROFESSIONAL ENGINEER
M. G. FLIS
100149153
07-26-2024
PROVINCE OF ONTARIO

DELTINI COMMERCIAL DEVELOP. LTD
636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

OVERALL GRADING PLAN

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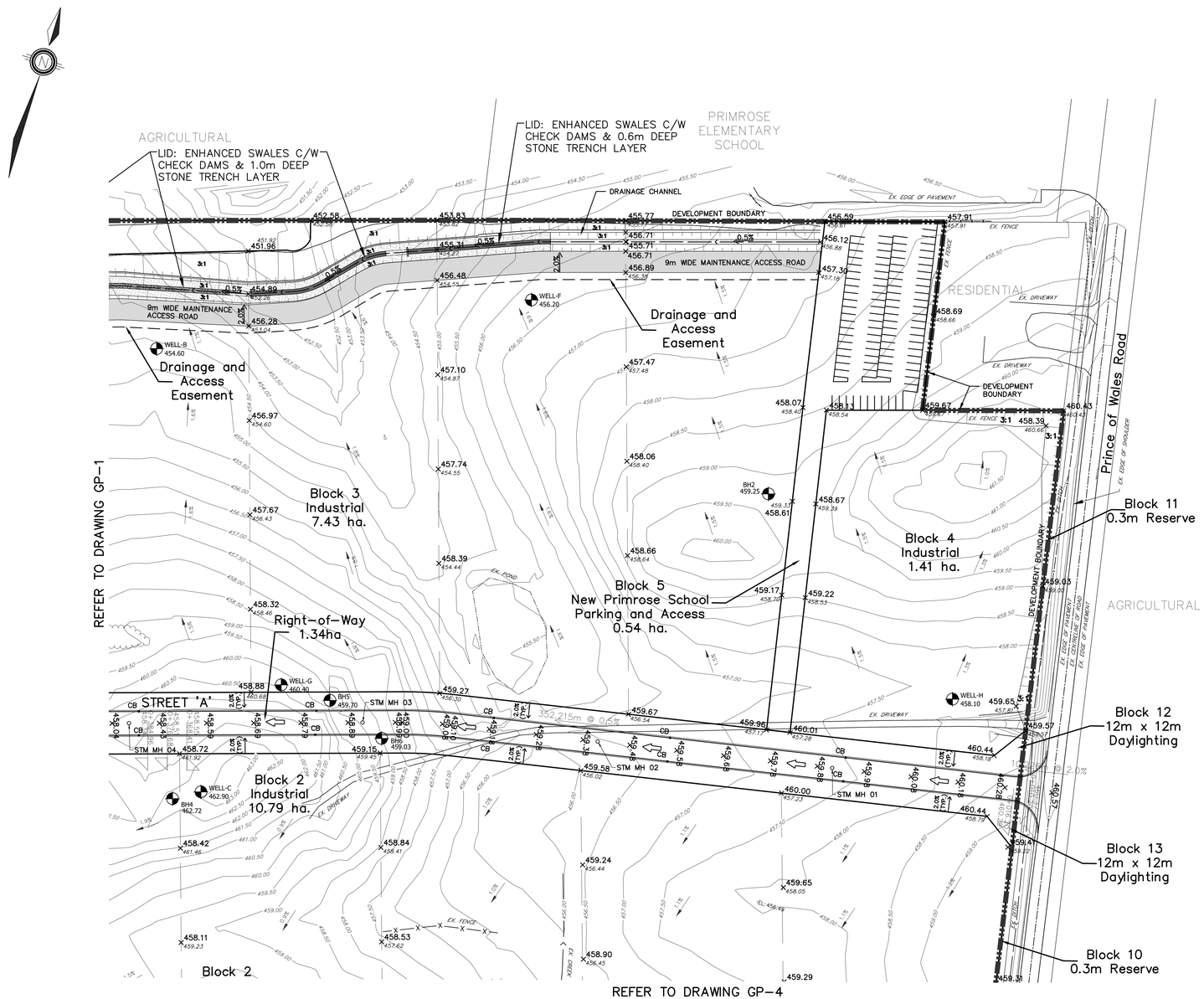

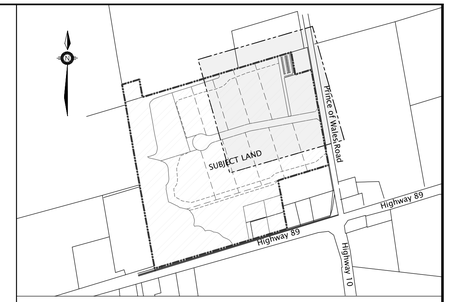

KEY PLAN
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LEGEND

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- EX. CONTOUR AND ELEVATION
- EX. DITCH
- PROP. STM MH
- PROP. STM DOUBLE CATCHBASIN
- PROP. STM CATCHBASIN
- SLOPE (3:1 MAX.)
- EX. BOREHOLE LOCATION ID# & GROUNDWATER ELEVATION
- WATER SUPPLY WELLS
- MAJOR OVERLAND FLOW ROUTE
- GRADE CHANGE FLAG
- ℄ ROAD LENGTH & GRADE
- PROPOSED ELEVATION
- EXISTING ELEVATION
- DRAINAGE CHANNEL ℄
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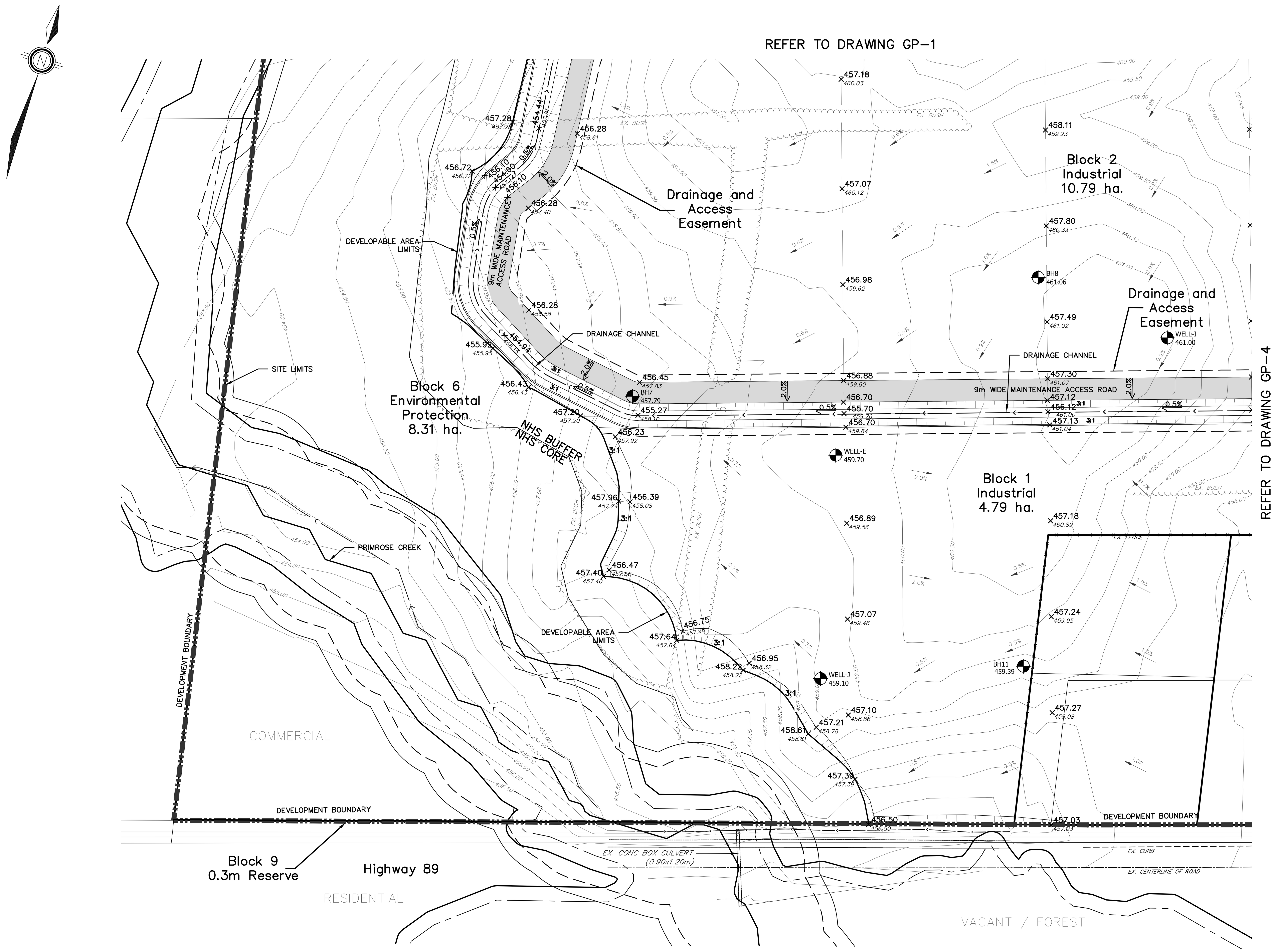

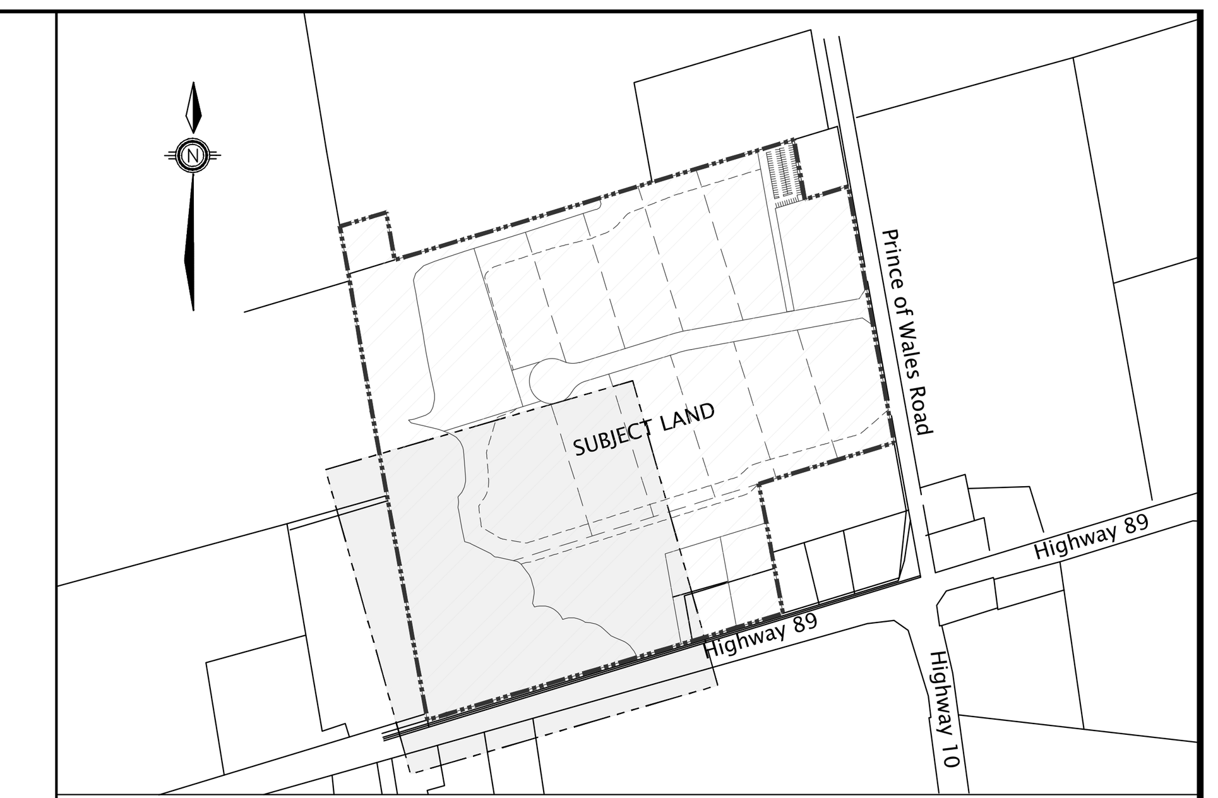

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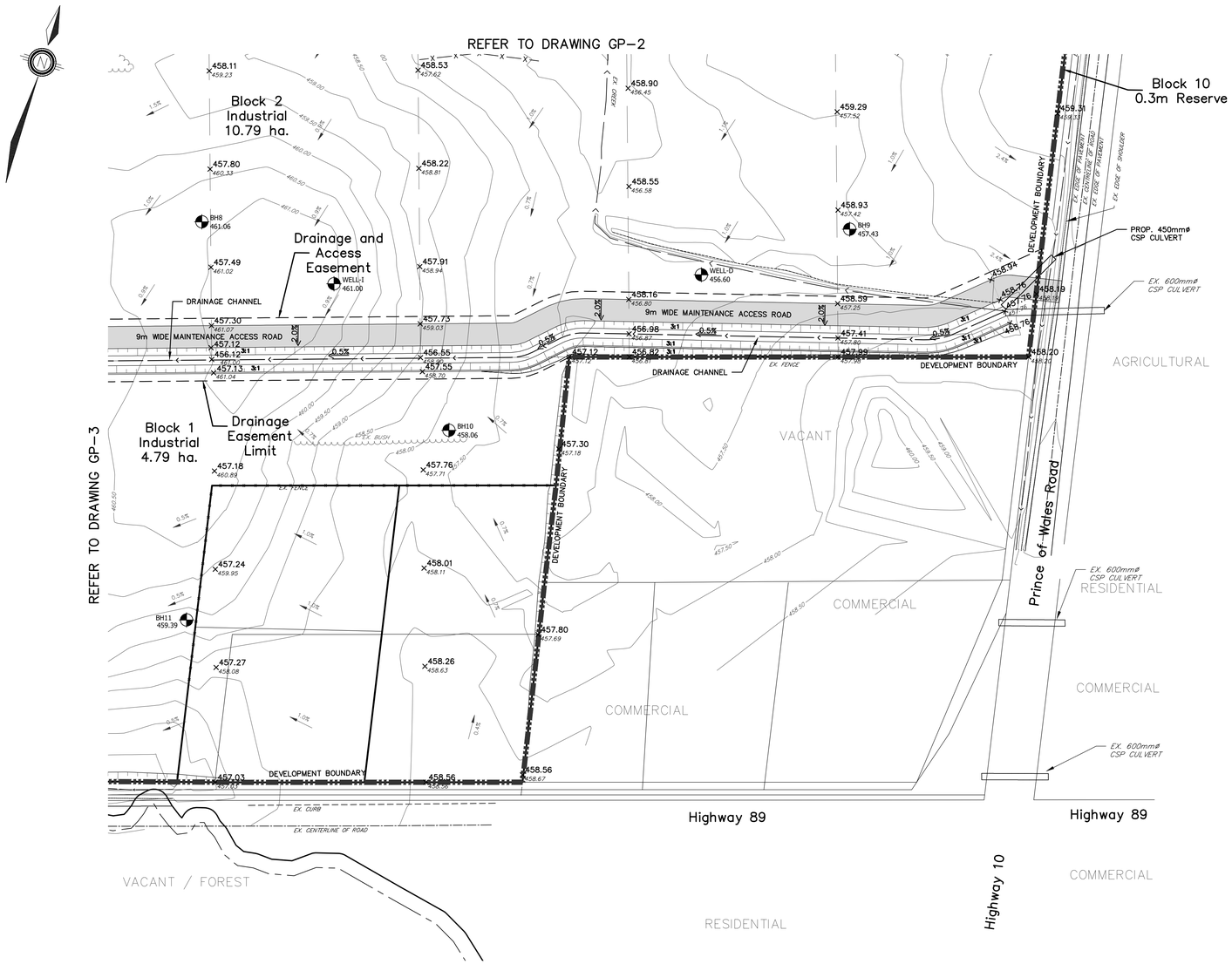

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1.	CONCEPTUAL DESIGN	MAY 2020	MF

LICENSED PROFESSIONAL ENGINEER M. G. FUJS 90011-19153 07-26-2024 PROVINCE OF ONTARIO

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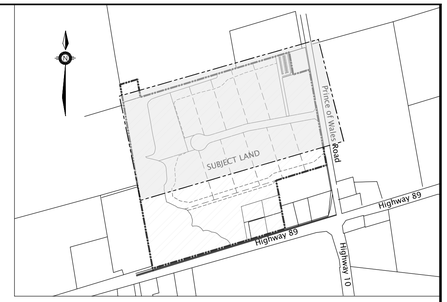
DESIGN VBS	SCALE: 1:1000	DATE MAY 2021	
DRAWN VBS	PROJECT FRE-17110	DWG. Nº GP-4	
CHECKED MF/DR			

5 Year Storm Sewer Sizing

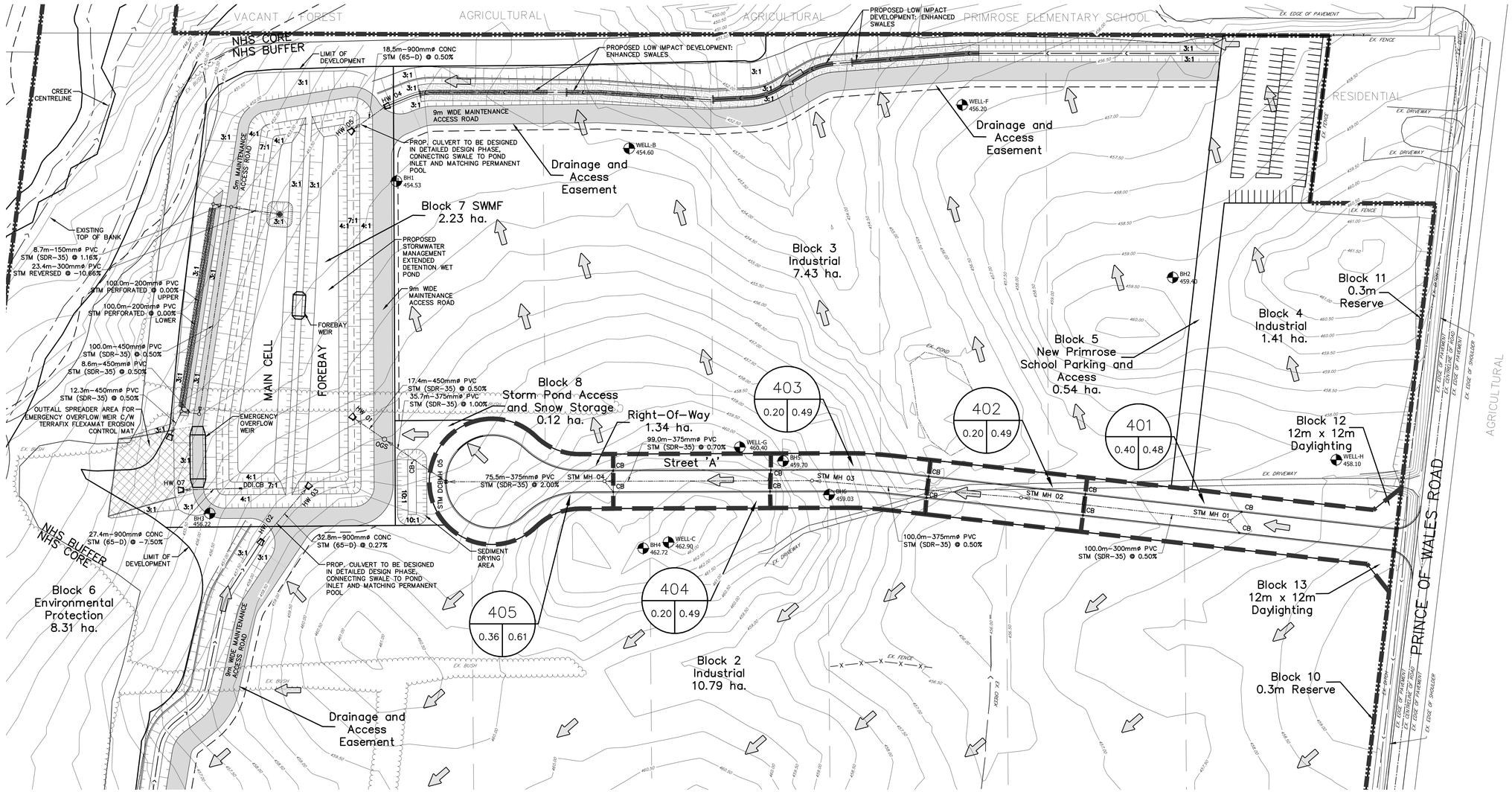
STREET	AREAS	MANHOLE		LENGTH	INCREMENT			TOTAL	FLOW TIME (min)		I	TOTAL Q	S	D	Q FULL	V FULL	% FULL
		FROM	TO	(m)	C	A	CA	CA	TO	IN	(mm/h)	(cms)	(%)	(mm)	(cms)	(m/s)	
Street 'A'	401	STM MH 01	STM MH 02	100.0	0.48	0.40	0.19	0.19	10.00	1.72	109	0.059	**0.50**	**300**	0.068	1.0	85.6
Street 'A'	402	STM MH 02	STM MH 03	100.0	0.49	0.20	0.10	0.29	11.72	1.48	100	0.080	**0.50**	**375**	0.124	1.1	64.8
Street 'A'	403	STM MH 03	STM MH 04	99.0	0.49	0.20	0.10	0.38	13.21	1.24	94	0.100	**0.70**	**375**	0.147	1.3	68.2
Street 'A'	404	STM MH 04	STM DCBMH 05	75.5	0.49	0.20	0.10	0.48	14.45	0.56	89	0.119	**2.00**	**375**	0.248	2.2	47.8
Block 8	405	STM DCBMH 05	OGS	35.7	0.61	0.36	0.22	0.70	15.01	0.37	87	0.170	**1.00**	**375**	0.175	1.6	96.7
Block 7		OGS	HW 01	17.4				0.70	15.39	0.23	86	0.167	**0.50**	**450**	0.202	1.3	82.9
	Total					1.35	0.70										
	Q= C*I*A / 360 (cms);				C= RUNOFF COEFFICIENT			I-RAINFALL INTENSITY (5 Year) = 853.608 / (td+4.699)^0.766					A=AREA (ha)				

LEGEND

- LIMIT OF SUBDIVISION
- DIRECTION OF OVERLAND FLOW
- 253.00 EX. CONTOUR AND ELEVATION
- CATCHMENT AREA ID NUMBER
- 101 / 0.35 | 0.84 — RUN-OFF COEFFICIENT
- AREA (ha.)
- CATCHMENT AREA BOUNDARY
- SLOPE (3:1 MAX.)
- WELL-C 462.90 — WATER SUPPLY WELLS
- BH4 462.72 — BOREHOLE
- EX. DITCH
- WATERCOURSE
- MEANDER BELT WIDTH
- 6M BUFFER OF MEANDER BELT WIDTH
- REGIONAL FLOODLINE EXISTING CONDITIONS
- 6M BUFFER OF REGIONAL FLOODLINE EXISTING CONDITIONS
- PROP. STORM SEWER & FLOW DIRECTION
- STM 01 — PROP. STM MH
- STM DCBMH 05 — PROP. STM DOUBLE CATCHBASIN
- CB — PROP. STM CATCHBASIN



KEY PLAN
NTS



BENCHMARK:

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NO.	REVISIONS	DATE	INITIAL
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1.	CONCEPTUAL DESIGN	MAY 2020	MF

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MULMUR PROPERTY

STORM DRAINAGE PLAN & STORM SEWER DESIGN SHEET

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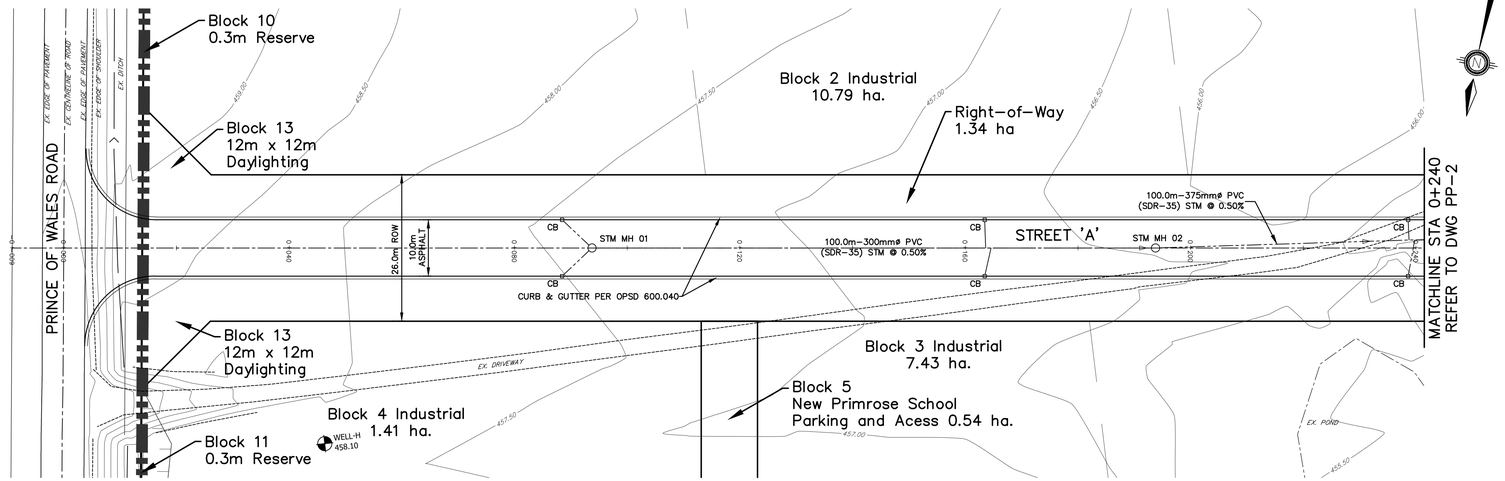
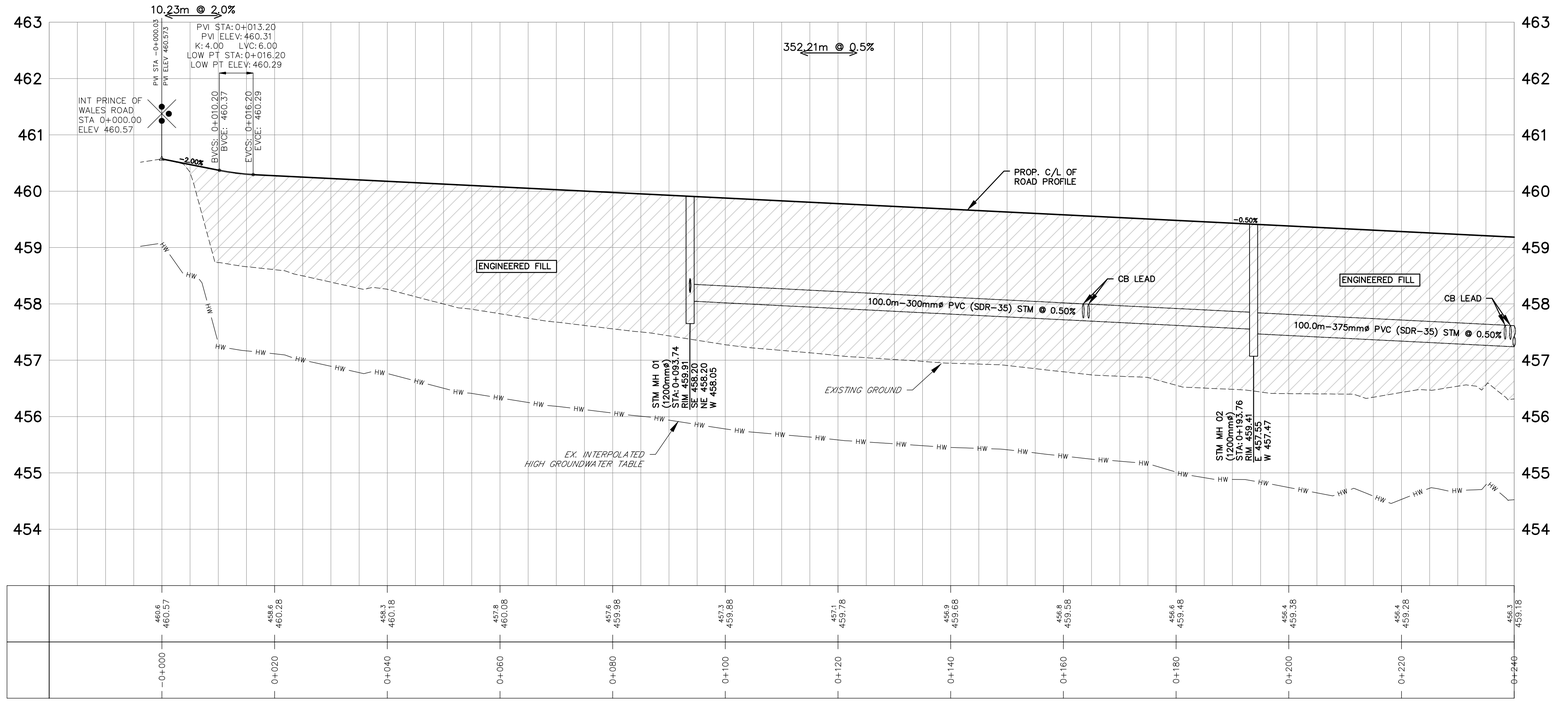
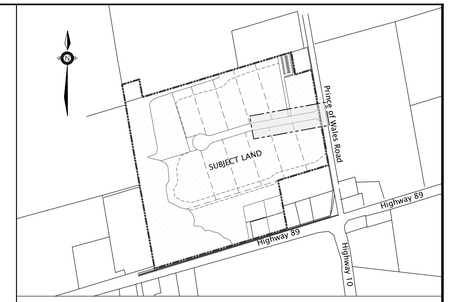
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	VBS	SCALE: 1:1000	DATE MAY 2021
DRAWN	VBS	PROJECT FRE–17110	DWG. Nº STM–1
CHECKED	MF/DR		







KEY PLAN
NTS

LEGEND

- LIMIT OF SUBDIVISION
- EX. CONTOUR AND ELEVATION — 460.00
- EX. DITCH
- STORM MANHOLE — STM MH 01
- CATCHBASIN — CB
- DOUBLE CATCHBASIN — DCB
- PROP. STORM SEWER & FLOW DIRECTION
- PROP. STM DOUBLE CATCHBASIN — STM DCBMH 05
- BOREHOLE — BH4 462.72
- SLOPE (3:1 MAX.)
- ℄ ROAD LENGTH & GRADE — 352.21m @ 0.5%
- ENGINEERED FILL
- WATER SUPPLY WELLS — WELL-C 462.90

BENCHMARK:

ELEVATIONS ARE GEODETIC AND ARE DERIVED BY REAL TIME OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83 (CSRS)(2010).

NO.	REVISIONS	DATE	INITIAL
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1.	CONCEPTUAL DESIGN	MAY 2020	MF

LICENSED PROFESSIONAL ENGINEER
M. G. FUS
90014 9153
07-26-2024
PROVINCE OF ONTARIO

DELTINI COMMERCIAL DEVELOP. LTD
636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

PLAN AND PROFILE
STREET A
STA 0+000 TO 0+240

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PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
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F. 705.734.1056

DESIGN	VBS	SCALE: 1:500	DATE MAY 2021
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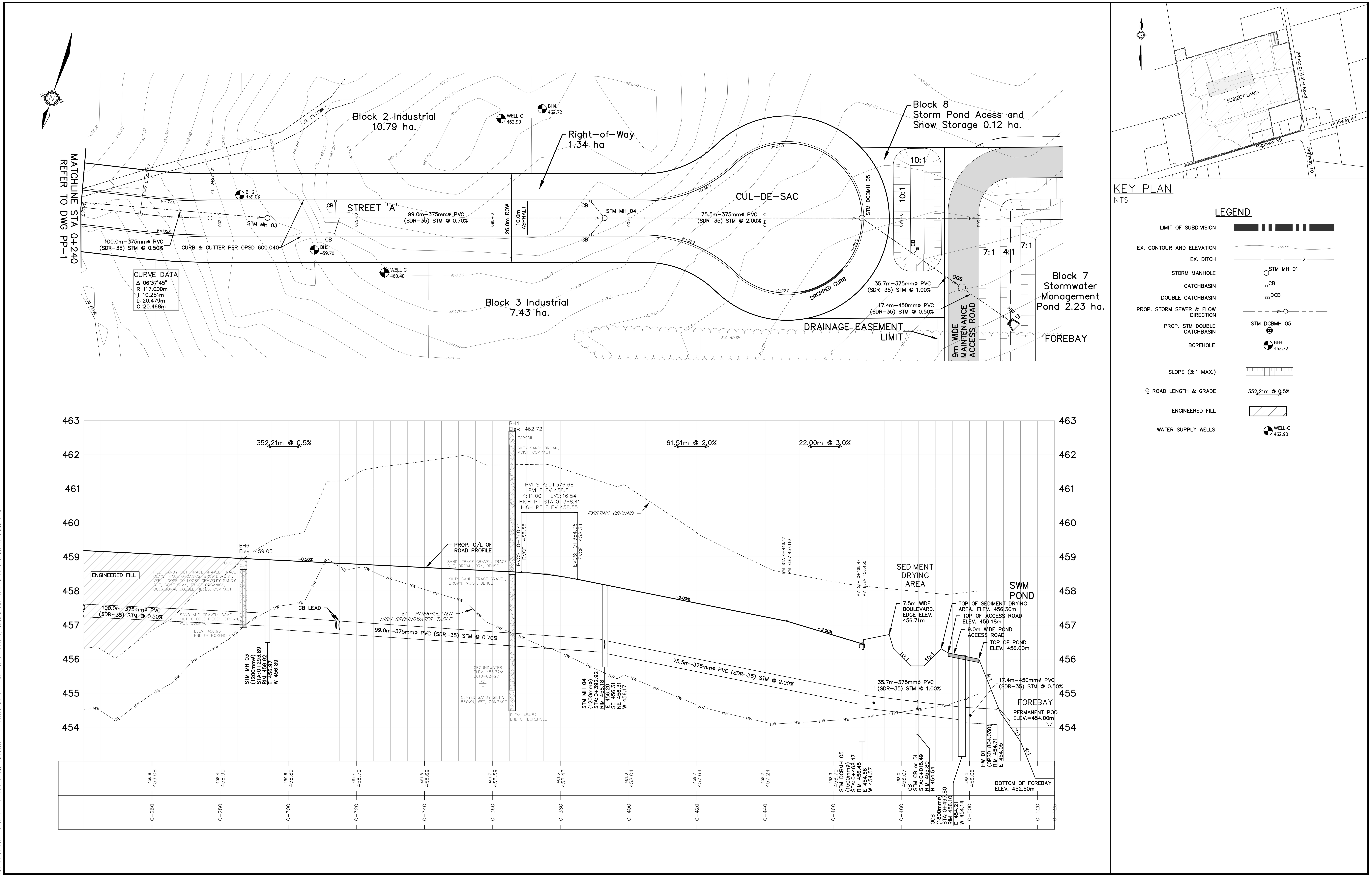
CHECKED	MF/DR		



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1.	CONCEPTUAL DESIGN	MAY 2020	MF

LICENSED PROFESSIONAL ENGINEER
M. G. FLIS
100149153
07-26-2024
PROVINCE OF ONTARIO

DELTINI COMMERCIAL DEVELOP. LTD
636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

PLAN AND PROFILE
STREET A
STA 0+240 TO 0+525

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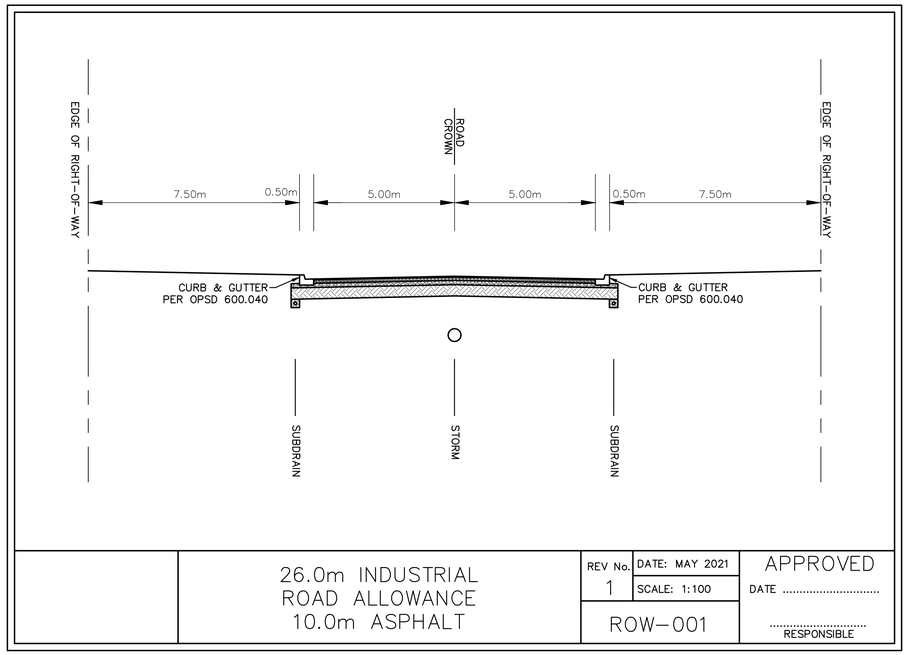
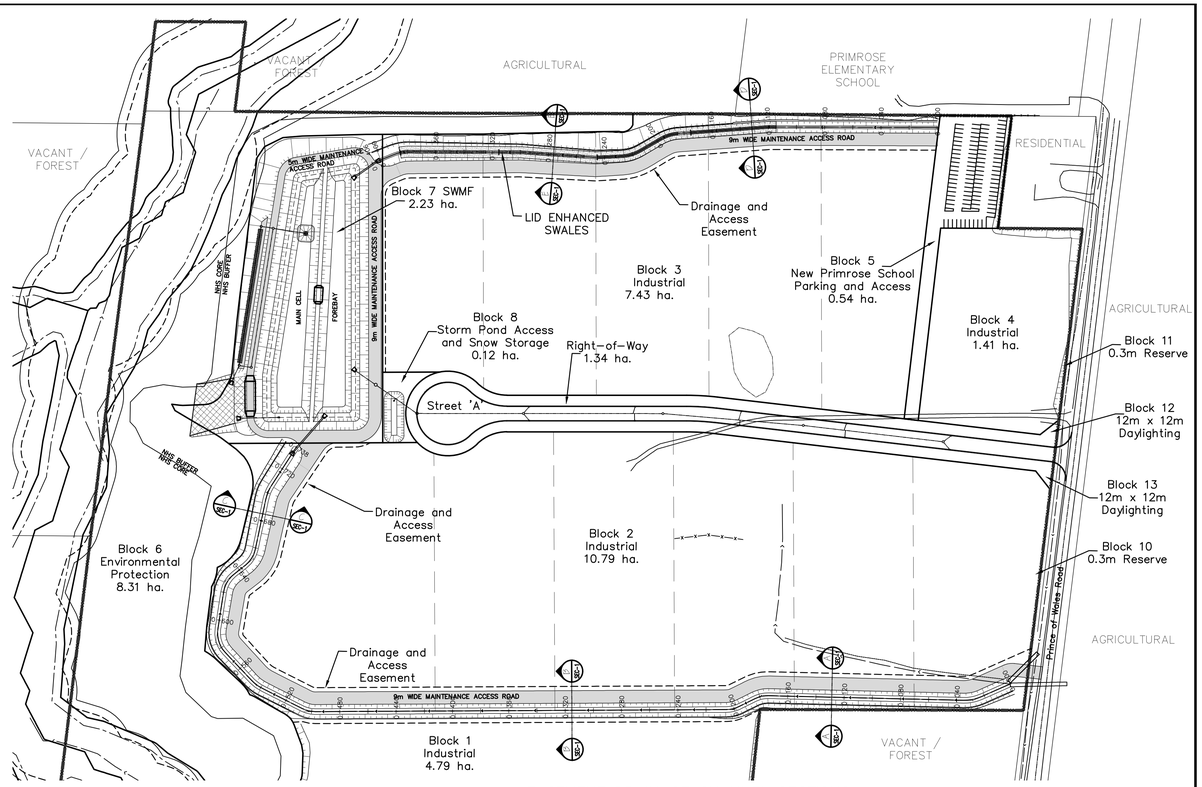
DESIGN VBS	SCALE: 1:500	DATE MAY 2021	
DRAWN VBS	PROJECT	DWG. №	
CHECKED MF/DR	FRE-17110	PP-2	



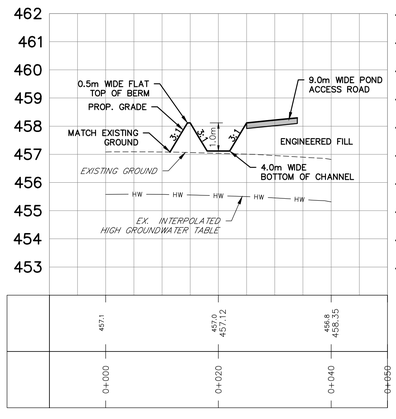
	26.0m INDUSTRIAL ROAD ALLOWANCE 10.0m ASPHALT	REV No. 1	DATE: MAY 2021	APPROVED
			SCALE: 1:100	DATE .....
		ROW-001		..... RESPONSIBLE

INDUSTRIAL ROAD CROSS SECTION
AS NOTED

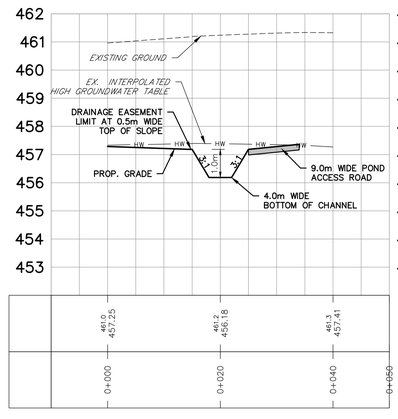


EASEMENT DRAINAGE CHANNEL SECTIONS
SCALE 1:2000

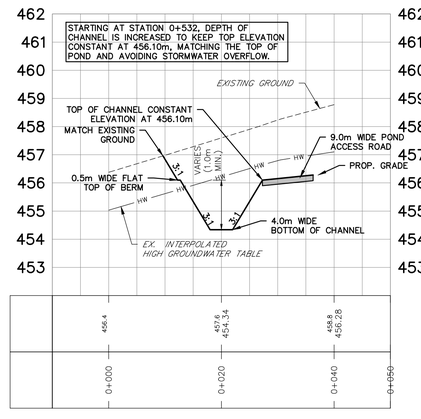
NOTE:
SOUTH DRAINAGE SWALE TO INCLUDE A GEOSYNTHETIC CLAY LINER. DETAILS INCLUDING LINER MATERIAL, DEPTH, SUBDRAINS, ETC. WILL BE PROVIDED AT THE DETAILED DESIGN STAGE.



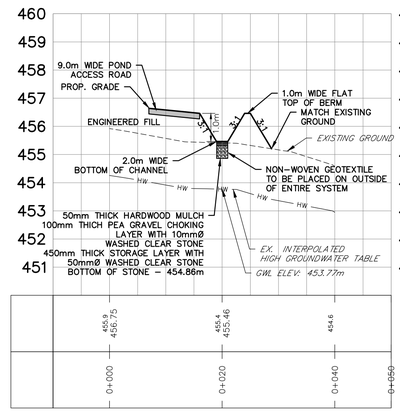
SECTION A–A
H 1:500 V 1:100



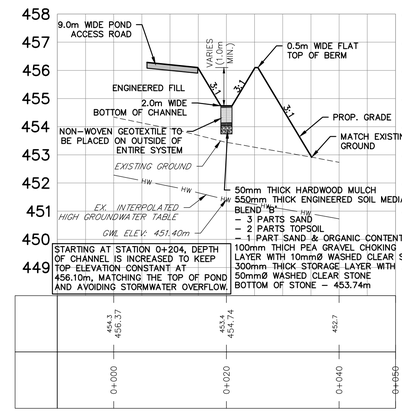
SECTION B–B
H 1:500 V 1:100



SECTION C–C
H 1:500 V 1:100



SECTION D–D
H 1:500 V 1:100



SECTION E–E
H 1:500 V 1:100

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4.	2nd SUBMISSION FOR DPA & ZBLA	JUL 2024	MF
3.	SUBMITTED FOR DPA & ZBLA	MAY 2021	MF
2.	PRELIMINARY FSR/SWMR	AUG 2020	MF
1.	CONCEPTUAL DESIGN	MAY 2020	MF

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DELTINI COMMERCIAL DEVELOP. LTD
636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

INDUSTRIAL ROAD CROSS SECTION & DRAINAGE EASEMENT SECTIONS

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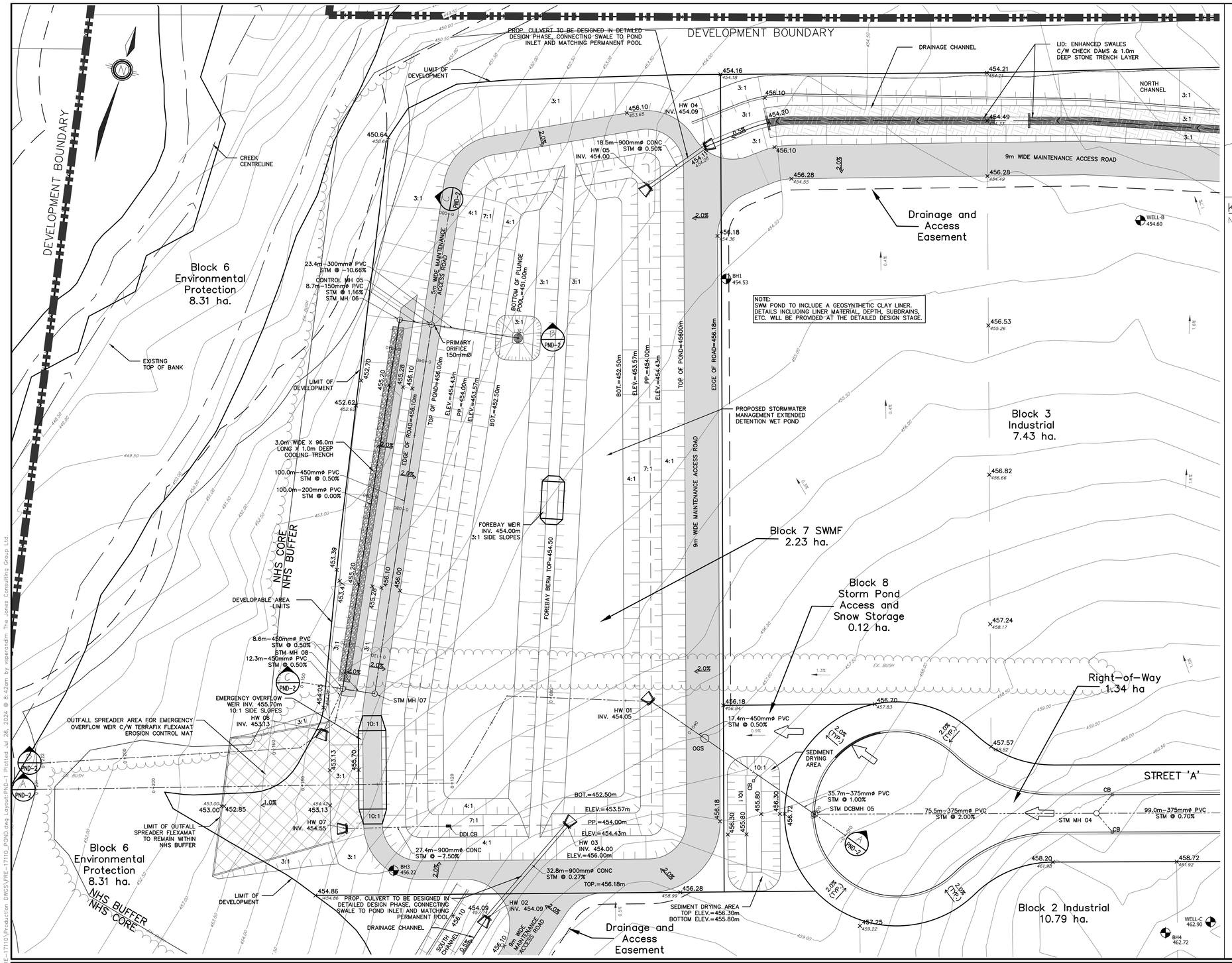
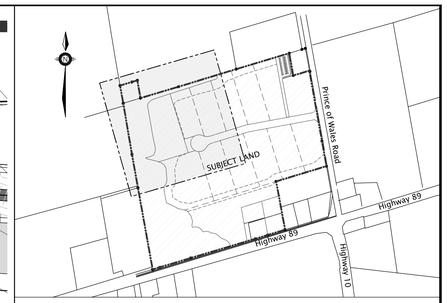
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN VBS	SCALE: AS NOTED	DATE FEB 2023	
DRAWN VBS	PROJECT FRE-17110	DWG. Nº SEC-1	
CHECKED MF/DR			





KEY PLAN
NTS

LEGEND

- LIMIT OF SUBDIVISION
- EX. CONTOUR AND ELEVATION
- EX. DITCH
- PROP. STM MH
- PROP. STM DOUBLE CATCHBASIN
- PROP. STM CATCHBASIN
- PROP. STM HEADWALL
- PROP. STM DOUBLE DITCH INLET
- BOREHOLE
- SLOPE (3:1 MAX.)
- WATER SUPPLY WELLS
- MAJOR OVERLAND FLOW ROUTE
- GRADE CHANGE FLAG
- ℄ ROAD LENGTH & GRADE
- PROPOSED ELEVATION
- EXISTING ELEVATION
- DRAINAGE CHANNEL ℄
- EX. DITCH
- WATERCOURSE
- MEANDER BELT WIDTH
- 6M BUFFER OF MEANDER BELT WIDTH
- REGIONAL FLOODLINE EXISTING CONDITIONS
- 6M BUFFER OF REGIONAL FLOODLINE EXISTING CONDITIONS

BENCHMARK:

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636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

POND PLAN VIEW

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229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	VBS	SCALE: 1:500	DATE JUNE 2023
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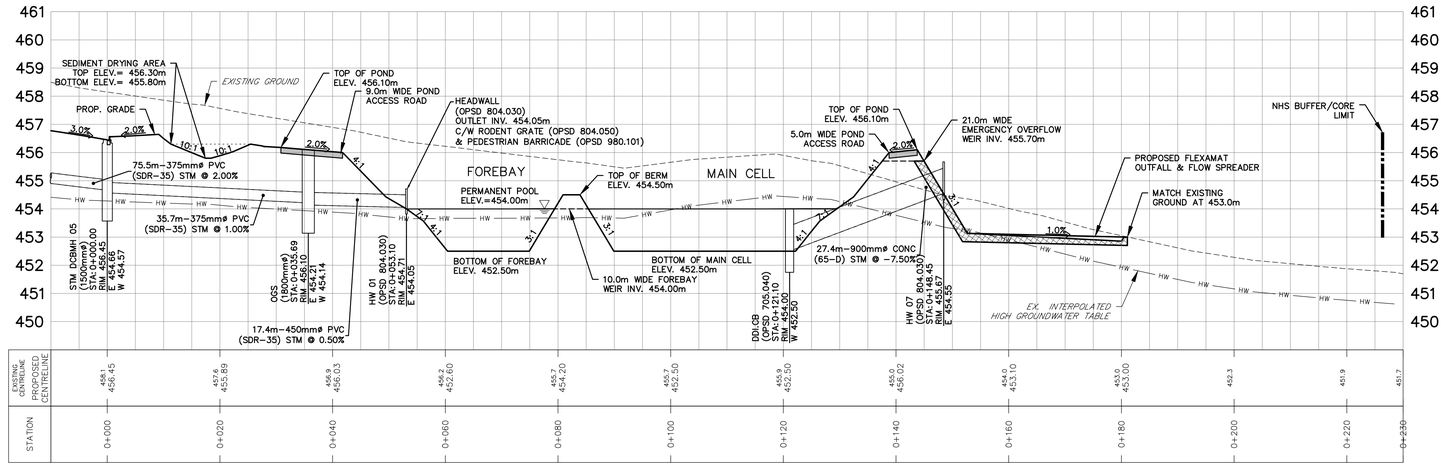
CHECKED	MF/DR		

SECTION A–A
PND-1 H 1:500 V 1:100



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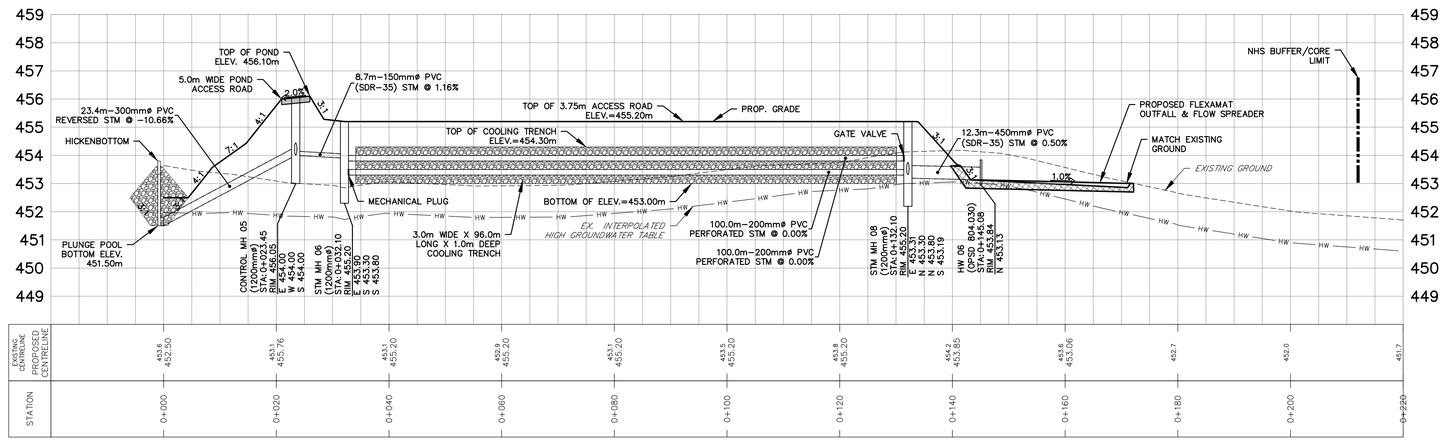
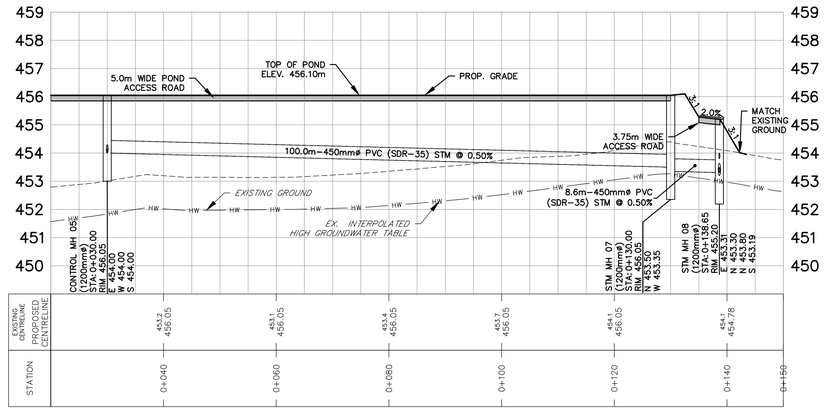


SECTION C–C
PND-1 H 1:500 V 1:100



NOTE:
SWM POND TO INCLUDE A GEOSYNTHETIC CLAY LINER. DETAILS INCLUDING LINER MATERIAL, DEPTH, SUBDRAINS, ETC. WILL BE PROVIDED AT THE DETAILED DESIGN STAGE.

BENCHMARK:

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M. G. FUS
100149153
07-26-2024
PROVINCE OF ONTARIO

DELTINI COMMERCIAL DEVELOP. LTD
636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

POND SECTIONS

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
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F. 705.734.1056

DESIGN	VBS	SCALE: AS NOTED	DATE JUNE 2023
DRAWN	VBS	PROJECT FRE–17110	DWG. № PND–2
CHECKED	MF/DR		

VACANT / FOREST

VACANT / FOREST

AGRICULTURAL

PRIMROSE ELEMENTARY SCHOOL

RESIDENTIAL

AGRICULTURAL

AGRICULTURAL

VACANT

COMMERCIAL

COMMERCIAL

RESIDENTIAL

COMMERCIAL

RESIDENTIAL

VACANT / FOREST

COMMERCIAL

SITE LIMITS

SITE LIMITS

SITE LIMITS

SITE LIMITS

SITE LIMITS

SITE LIMITS

SITE LIMITS

SITE LIMITS

PRIMROSE CREEK

PRIMROSE CREEK

DEVELOPABLE AREA LIMITS

DEVELOPABLE AREA LIMITS

DEVELOPABLE AREA LIMITS

EX. BUSH

EX. BUSH

EX. BUSH

EX. BUSH

EX. BUSH

Block 6
Environmental
Protection
8.31 ha.

PART 1

PART 2

PART 3

101
26.93 | 58.9

102
1.74 | 68.6

301
3.27 | 30%

302
1.35 | 30%

303
9.16 | 54.8

304
0.96 | 46%

305
0.23 | 68%

Prince of Wales Road

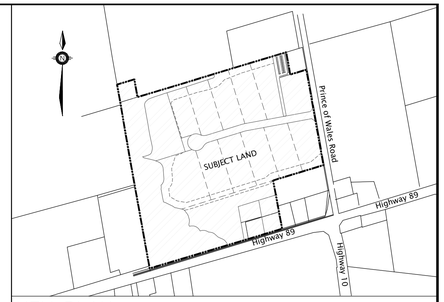
Highway 89

Highway 89

Highway 89

Highway 10

N



KEY PLAN
NTS

LEGEND

- LIMIT OF SUBDIVISION
- DIRECTION OF OVERLAND FLOW
- 253.00 EX. CONTOUR AND ELEVATION
- CATCHMENT AREA ID NUMBER
- 404 / 1.03 | 0.65 — CURVE NUMBER OR % IMPERVIOUS; AREA (ha.)
- CATCHMENT AREA BOUNDARY
- WATERCOURSE
- MEANDER BELT WIDTH
- 6M BUFFER OF MEANDER BELT WIDTH
- REGIONAL FLOODLINE EXISTING CONDITIONS
- 6M BUFFER OF REGIONAL FLOODLINE EXISTING CONDITIONS

BENCHMARK:

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LICENSED PROFESSIONAL ENGINEER
M. G. FUS
100149153
07-26-2024
PROVINCE OF ONTARIO

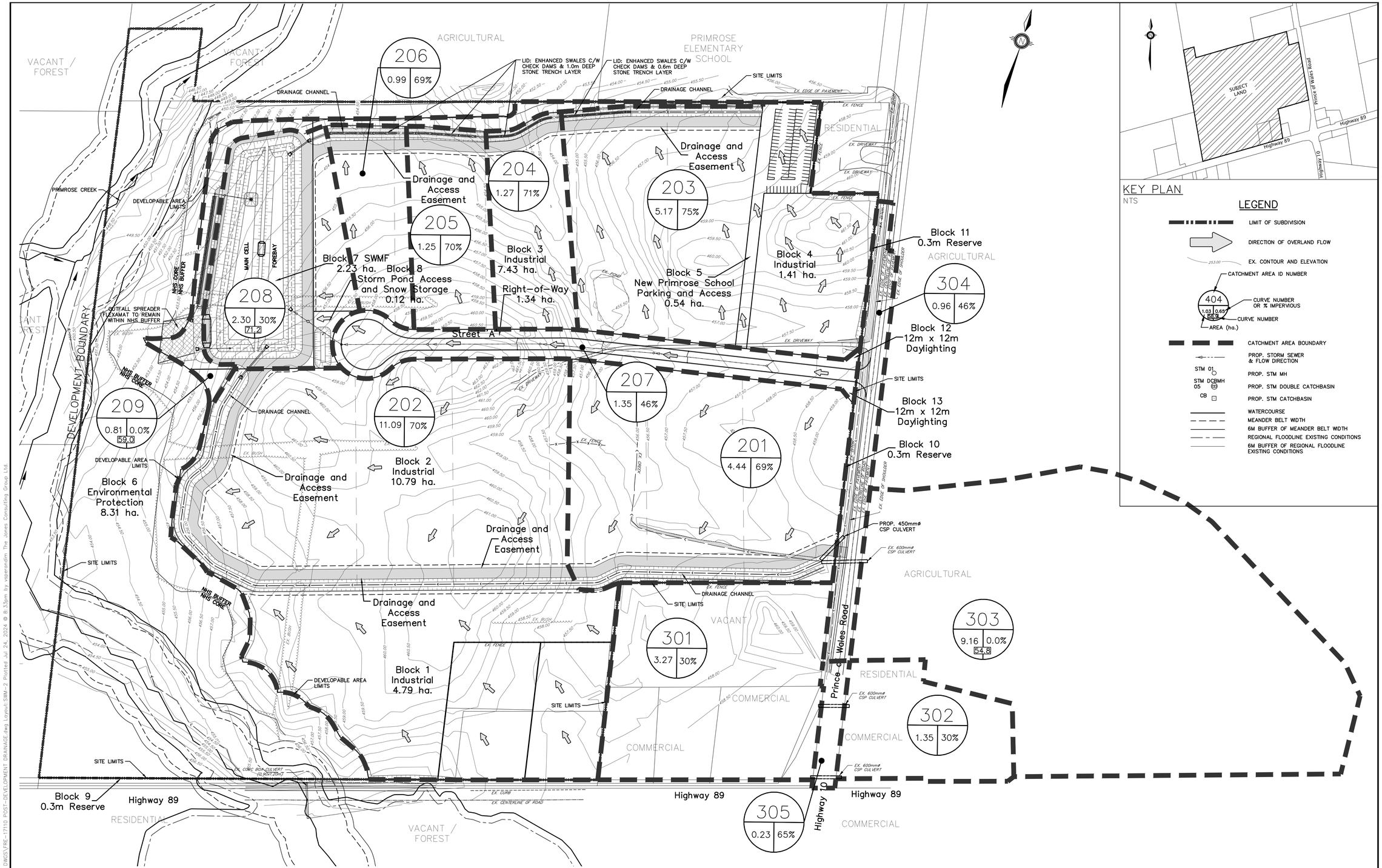
DELTINI COMMERCIAL DEVELOP. LTD
636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

STORMWATER MANAGEMENT PLAN
PRE-DEVELOPMENT CONDITION

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	VBS	SCALE: 1:1500	DATE MAY 2021
DRAWN	VBS	PROJECT FRE-17110	DWG. Nº SWM-1
CHECKED	MF/DR		

G:\Eng_3D\FRE-17110\Production DWGS\FRE-17110 PRE-DEVELOPMENT PLAN.dwg Layout: SWM-1 Plotted Jul 24, 2024 @ 8:31am by vpierondin The Jones Consulting Group Ltd



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3.	SUBMITTED FOR DPA & ZBLA	MAY 2021	MF
2.	PRELIMINARY FSR/SWMR	AUG 2020	MF
1.	CONCEPTUAL DESIGN	MAY 2020	MF

LICENSED PROFESSIONAL ENGINEER
M. G. FUS
90019153
07-26-2024
PROVINCE OF ONTARIO

DELTINI COMMERCIAL DEVELOP. LTD
636040 PRINCE OF WALES ROAD
MULMUR PROPERTY

STORMWATER MANAGEMENT PLAN
POST-DEVELOPMENT CONDITION

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
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DESIGN	VBS	SCALE: 1:1500	DATE MARCH 2020
DRAWN	VBS	PROJECT FRE-17110	DWG. Nº SWM-2
CHECKED	MF/DR		

Appendix B

Stormwater Management Calculations

- Hydrology Design Writeup
- Pre & Post Development Land Use Breakdown
- Storm Subcatchment Land Use Breakdown (added)
- Detailed Stage-Storage-Discharge Table for SWMF & Quality Design Notes
- Hydraulic Conveyance Calculations
    - Overland Flow Conveyance
    - Channel Lining & Erosion Protection – SWMF, North & South Channels
    - SWMF Emergency Overflow Weir Capacity
    - SWMF Emergency Overflow Weir Channel Lining & Erosion Protection
- OTTHYMO Peak Flow Models – Summary of Results
- OTTHYMO LID Models – Performance Summary
- Low Impact Development Treatment Train Tool – Release Notes: Land Cover EMC's
- Pre-Development and Post-Development TP Mass Balance Calculations
- Water Quality Calculations – LID Facility Drawdown Time
- Excerpts from WSP's Water Balance Study – Tables A-3 & A-4
- Excerpt from Soil Map of Dufferin County, Ontario, Soil Survey Report No. 38
- MTO IDF Curve look-up

Hydrology Design Writeup

Table of Contents

1. OTTHYMO Model

The development was hydrologically modelled using the latest version of Visual OTTHYMO Modeling (version 6.2) by *Civica Infrastructure.* OTTHYMO is a GIS-based hydrologic model capable of performing both event-based and continuous rainfall simulations for drainage and conveyance infrastructure design, SWM & LID design, water balance & erosion threshold calculations. Resulting infiltration rates obtained through Guelph Permeameter testing have been coded into the OTTHYMO model with an appropriate factor of safety.

2. Design Storms & Climatology

The rainfall events used for the OTTHYMO model simulations include the following:

- 4-hour Chicago rainfall distribution for the 2, 5, 10, 25, 50 and 100-year storm events;
- 24-hour SCS Type II rainfall distribution for the 2, 5, 10, 25, 50, and 100-year storm events;
- 25 mm 4-hour Chicago (Water Quality) rainfall event; and
- Timmins Regional Storm Event.

The rainfall data was based on the MTO website https://idfcurves.mto.gov.on.ca/ according to the site approximate coordinates. A webpage printout included **in Appendix B** illustrates the rainfall intensity, depth and the A, B parameters used to calculate the IDF curve and to set up the storm event simulations used in the Visual Otthymo Models.

The rainfall depth calculated for the Chicago 4h and SCS II 24h storm events is illustrated on the table below:

Rainfall depth (mm)		
Duration	**Chicago 4h**	**SCS II 24h**
2-yr	34.56	57.6
5-yr	45.6	76.8
10-yr	52.92	88.8
25-yr	62.25	105.6
50-yr	69.07	117.6
100-yr	76.11	129.6

In addition to the discrete storm events that were simulated for peak flow control and volumetric sizing of the end-of-pipe SWM facility and LID's, a continuous modeling simulation was developed to assess Runoff Volume Capture (for use in SWM quality control mass balance calculations) and Post-Development Water Balance Mitigation on an annual basis.

The Continuous modeling simulation uses a data set of daily precipitation for a one-year period, representing a typical year. Precipitation data was collected from the Government of Canada Environment and Natural Resources Historical Database for the closest two rain stations with greater than 20 years' worth of available data. Average annual precipitation was calculated for the two rain stations for a period of 20 years. A short list of presentative years was then selected based on the average annual precipitation. The representative years were then analyzed based on the number of storm events with greater than 25mm precipitation, and the completeness of data. As a result, the precipitation data from the Ruskview Rainfall station for 2003 was selected and added to the OTTHYMO model as a representative continuous data set. The total rainfall depth during the 2003 year period was 1,007.5mm. To advance the continuous model simulation's practicality, the corresponding sets of climatic data consisting of maximum and minimum daily temperatures was encoded into the OTTHYMO model.

3. Modeling Approach and Rationale

There are four (4) total OTTHYMO models with each model run under a range of discrete and continuous storm simulations to assess the performance of the proposed end-of-pipe stormwater management facility and low impact development infrastructure. The models evaluated are listed below:

- *Pre-Dev-PF:* Pre-development Peak Flow Model
- *Pre-Dev-LID*: Pre-development LID Model
- *Post-Dev-PF:* Post-development Peak Flow Model
- *Post-Dev-LID:* Post-development LID Model

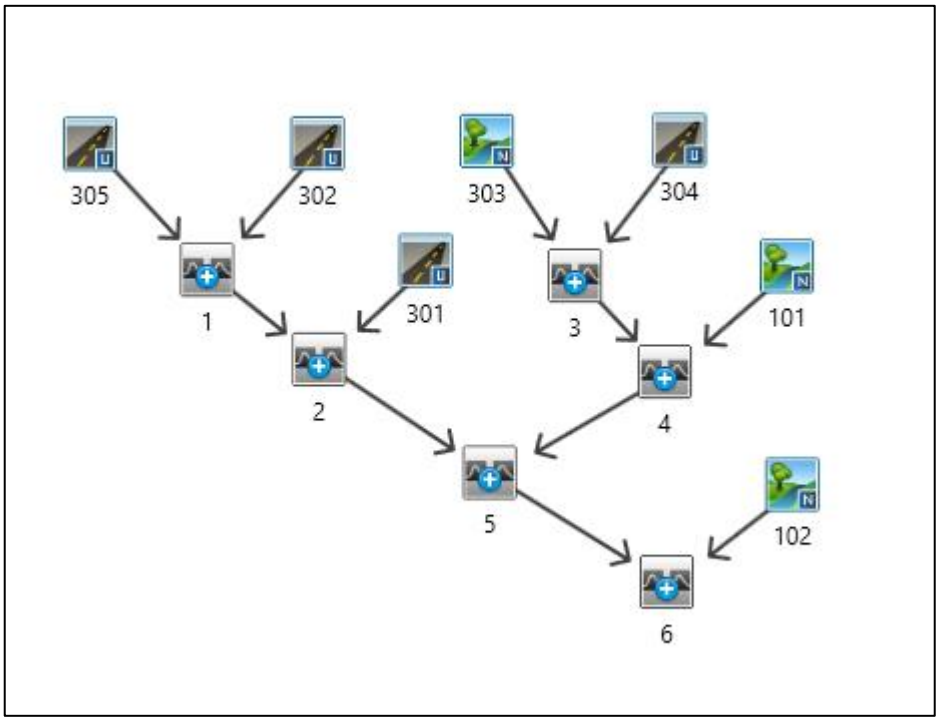
As indicated by the naming convention the *Pre-Dev* model has been used to establish pre-development peak flow targets on a discrete storm event and continuous basis. The *Post-Dev-PF* and *Post-Dev-LID* models will be analyzed against the pre-development model to assess SWMF & LID sizing and assist in setting targets for future individual Site Plan developments to incorporate LID in their respective SWM designs to meet NVCA erosion control, phosphorus and water balance criteria.

4. Discretization

Model discretization for the *Pre-Dev-PF, Pre-Dev-LID, Post-Dev-PF,* and *Post-Dev-LID* models, developed under the approach described previously, is summarized herein. Detailed OTTHYMO model input parameters have been provided in the following supporting calculations**.**

4.1 Pre-Development Peak Flow Modeling

The Catchment areas used for the Peak Flow pre-development model are shown on **Drawing SWM-1** in **Appendix A.** The below figure shows the *Pre-Dev-PF* model schematic.



***Pre-Dev* Model Schematic**

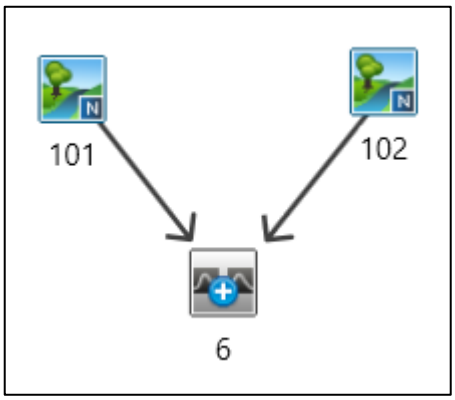
The OTTHYMO *Pre-Dev* model includes seven (7) discrete catchments.

- Catchment 101 is approximately 26.93 ha in size and represents internal developable area of the subject lands. The catchment area is composed of predominately agricultural land and pasture with a small portion of the land classified as light forest and commercial. This catchment area primary drains in a north-westerly direction towards Primrose Creek.
- Catchment 102 is approximately 1.74 ha in size and represents internal developable area of the subject lands. This catchment area is a mix between agricultural, pasture, and commercial lands and drains in a southern direction towards the Highway 10/89 road drainage ditch.
- Catchment 301 is approximately 3.27 ha in size and represents existing external area which drains through the subject lands. This catchment area has been recently redeveloped and consists of primarily commercial lands.
- Catchment 302 is approximately 1.35 ha in size and represents existing external area which drains westwards towards Prince of Wales Road. This area is captured through the use of 600mm diameter corrugated steel pipe culverts and drains westwards onto catchment 301 and ultimately through the subject lands. This catchment area has multiple existing structures including a restaurant, homes, and accessory structures.
- Catchment 303 is approximately 9.16 ha in size and represents existing external catchment areas that drain through the subject site. This catchment is a mix of agricultural, forested, and pasture lands. Flows are directed by natural grading in a north-western direction towards another 600mm corrugated steel pipe culvert and discharge to a drainage course within the subject lands.
- Catchment 304 is approximately 0.96 ha in size and represents external catchment area associated with the Prince of Wales Road right-of-way captured by the road drainage ditching and discharged westwards to the subject lands.
- Catchment 305 is approximately 0.23 ha in size and represents external catchment area associated with the Prince of Wales Road right-of-way. Flows generated in this area are captured by the road drainage ditch and are discharged to catchment 301 before discharging to the subject site.

This provides a total catchment area of approximately **43.64 ha.**

4.2 Pre-Development LID Modeling

The Catchment areas used for the LID pre-development model are shown on **Drawing SWM-1** in **Appendix A.** The below figure shows the *Pre-Dev-LID* model schematic.

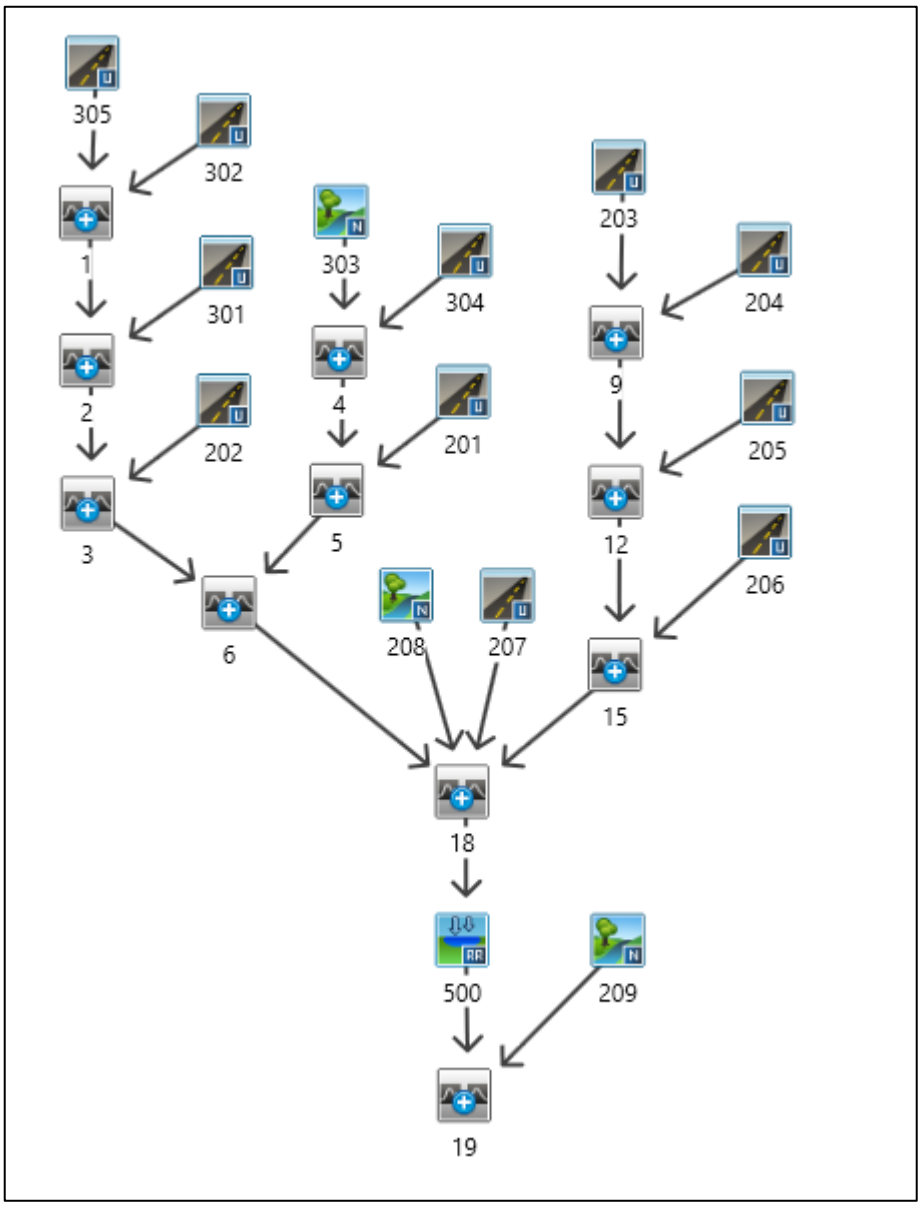


***Pre-Dev-LID* Model Schematic**

The OTTHYMO *Pre-Dev-LID* model includes two (2) discrete catchments. These catchments are identical to catchments 101 and 102 previously described in the pre-development peak flow model, **Section 4.1.**

4.3 Post-Development Peak Flow Modeling

The Catchment areas used for the Peak Flow post-development modeling are shown on **Drawing SWM-2** in **Appendix A.** The below figure shows the *Post-Dev-PF* model schematic.



***Post-Dev-PF* Model Schematic**

The OTTHYMO *Post-Dev-PF* model includes fourteen (14) discrete catchments.

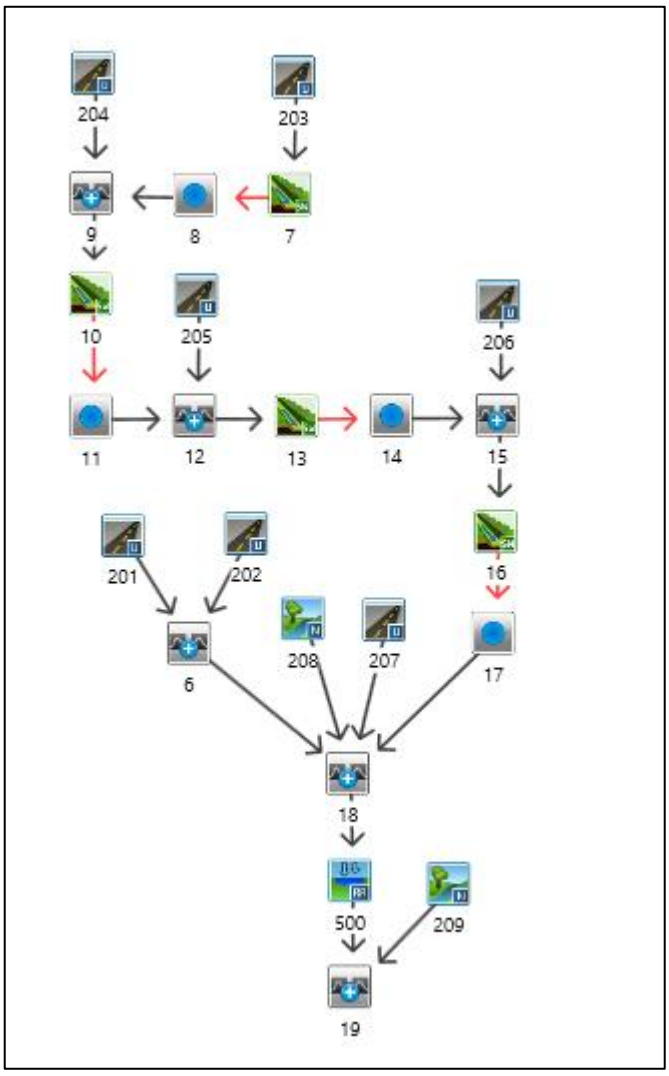
- Catchment 201 is approximately 4.44 ha in size and represents internal developable lands within the development. This area is composed of portions of Block 2 Industrial lands as well as portions of the southern drainage easement and access roadway. Flows generated from Catchments 304 and 303 are collected and directed through the proposed drainage channel towards the end-of-pipe SWMF.
- Catchment 202 is approximately 11.09 ha in size and represents internal developable lands within the development. This area is composed of portions of Block 1 & 2 Industrial lands as well as portions of the southern drainage easement and access roadway.

- **Catchments 203, 204, 205** and **206** are approximately 5.17 ha, 1.27 ha, 1.25 ha, and 0.99 ha in size respectively and represent internal developable lands of the development. These areas are composed of a portion of Block 3 & 4 Industrial land, Block 5 Primrose School Parking and Access as well as portions of the northern drainage channel. Flow generated in these catchments are directed north-easterly and are captured by the northern drainage channel. Stormwater is treated through the enhanced swale before discharging to the end-of-pipe facility.
- **Catchment 207** is approximately 1.35 ha in size and represents internal developable lands of the development. This area is exclusively composed of the Street A right-of-way limit and has a series of catchbasin and manhole structures that collect stormwater and discharge it to the end-of-pipe facility.
- **Catchment 208** is approximately 2.30 ha in size and represents Internal developable land. This catchment contains portions of Block 7 Stormwater Management Pond, Block 3 Industrial and the entirety of Block 8 Snow Storage. Stormwater will be directed to the end-of-pipe facility located within this area before being treated and discharged to Primrose Creek.
- **Catchment 209** is approximately 0.81 ha in size and represents internal developable land that could not be directed towards the stormwater management facility because of grading constraints. This catchment contains portions of Block 2 & 3 Industrial lands and Block 5 Stormwater Management Pond. Flows generated from this area release uncontrolled to Primrose Creek and the Environmentally Protected area.
- **Catchments 301** through **Catchment 305** are approximately 3.27 ha, 1.35 ha, 9.16 ha, 0.96 ha, and 0.23 ha in size respectively and are identical to the catchments described previously in the pre-development model, **Section 4.1.**

This provides a total catchment area of approximately **43.64 ha** which matches the pre-development overall catchment area**.**

4.4 Post-Development LID Modeling

The Catchment areas used for the LID post-development modeling are shown on **Drawing SWM-2** in **Appendix A.** The below figure shows the *Post-Dev-LID* model schematic.



***Post-Dev-LID* Model Schematic**

The OTTHYMO *Post-Dev-LID* model includes nine (9) discrete catchments. These catchments are identical to the catchments previously described in the post-development peak flow model **Section 4.3** except for the external catchments 301 through 305 which have been removed from the LID model.

5. OTTHYMO Model Results

The hydrologic modeling results from the *Pre-Dev-PF* & *Post-Dev-PF* models are summarized herein. From a review of the model output, it was determined that the 24-Hour SCS Type II Storm distribution would govern for Volume and generally for Peak Flow Control. The post-development runoff peak flow rates summarized in the following results table have been extracted at the *Outfall Node* of the overall catchment, which takes into account both controlled (pond outflow) and uncontrolled peak flows. Refer to the OTTHYMO *Pre-Dev-PF* and *Post-Dev-PF* model results further in **Appendix B.**

SWM Water Quantity Results

Single Event Duration Storm Peak Event Flow (m^3/s)							
Storm Distribution	**Area (ha)**	**Return Period (years)**					
		2	**5**	**10**	**25**	**50**	**100**
Pre-Development Condition							
CHI 4-Hr Storm Distribution	43.64	0.494	0.697	0.843	1.067	1.247	1.424
SCS 24-hr Storm Distribution	43.64	0.681	1.146	1.496	2.057	2.469	2.921
25mm 4hr Chicago Storm	43.64	0.244					
Timmins Regional Storm	43.64	2.658					
Post-Development Condition (with attenuation)							
CHI 4-Hr Storm Distribution	43.64	0.038	0.147	0.188	0.315	0.515	0.694
SCS 24-hr Storm Distribution	43.64	0.153	0.346	0.678	1.033	1.245	1.441
25mm 4hr Chicago Storm	43.64	0.026					
Timmins Regional Storm	43.64	2.331					

The results demonstrate that the proposed stormwater management facility will provide the required quantity control to reduce post-development peak flows to the allowable release rates for their respective areas.

LID results are best viewed on the *LID Performance Summary* and *Mass Balance Calculations* found further in **Appendix B**. Additional LID measures are recommended to be included at the source to achieve the NVCA's criteria for Phosphorus removal, Erosion Control, and Water Balance, subject to Site Plan Control.

636040 Prince of Wales Road
Pre & Post Development Land Use Breakdown

CLIENT: DELTINI Commercial Developments Inc.

DATE: Jul 2024

PROJECT: 636040 Prince of Wales Road

DESIGN: MG/VS

FILE: FRE-17110 (50)

CHECKED: MF

Pre-Development Land Use Breakdown

Catchment Area	Wetlands (Ha)	Forests (Ha)	Pasture/Cultivated (Ha)	Roof (Disconnected) (Ha)	Pavement (Connected) (Ha)	Total (Ha)	TIMP (%)
101	0.1172	0.4141	26.2567	0.0437	0.0842	26.91	0%
102	0.0000	0.0000	1.3334	0.1312	0.2769	1.74	23%
Totals	0.1172	0.4141	27.5901	0.1749	0.3611	**28.65**	**2%**

Post-Developmet Land Use Breakdown

Catchment Area	Wetlands (Ha)	Forests (Ha)	Pasture/Cultivated (Ha)	Roof (Impervious Disconnected) (Ha)	Pavement (Ha)	Total (Ha)	TIMP (%)
301	0.0000	0.0000	2.2890	0.0000	0.9810	3.27	30%
302	0.0000	0.0000	0.9447	0.1345	0.2695	1.35	30%
303	2.8880	1.3240	4.9480	0.0000	0.0000	9.16	0%
304	0.0000	0.0000	0.5231	0.0000	0.4369	0.96	46%
305	0.0000	0.0000	0.0813	0.0000	0.1517	0.23	65%
201	0.0000	0.0000	1.3741	1.5287	1.5357	4.44	69%
202	0.0000	0.0000	3.3427	3.8877	3.8615	11.09	70%
203	0.0000	0.0000	1.3061	1.9158	1.9454	5.17	75%
204	0.0000	0.0000	0.3631	0.4590	0.4439	1.27	71%
205	0.0000	0.0000	0.3689	0.4467	0.4335	1.25	70%
206	0.0000	0.0000	0.3125	0.3285	0.3521	0.99	69%
207	0.0000	0.0000	0.7314	0.0000	0.6196	1.35	46%
208	0.0000	0.0000	1.6186	0.2669	0.4170	2.30	30%
209	0.0000	0.0000	0.8138	0.0000	0.0000	0.81	0%
Totals	0.0000	0.0000	10.2312	8.8333	9.6087	**28.68**	**64%**

Overall contributing area to the SWM facility : 301, 302, 303, 304, 305, 201, 202, 203, 204, 205, 206, 207, 208

SWMF-208	2.8880	1.3240	18.2035	8.9678	11.4478	42.83	48%

Catchment Area SWMF-208	Wetlands (Ha)	Forests (Ha)	Pasture/Cultivated (Ha)	Roof (Impervious Disconnected) (Ha)	Pavement (Ha)		AVERAGE CURVE NUMBER
CURVE NUMBER	50	46	59	100	100		77.5

Project:	DELTINI COMMERCIAL DEVELOP. LTD	Date:	Jul-24
File No.:	FRE-17110	Designed:	VBS
Subject:	Land Use Breakdown	Checked:	MF
Revisions:			

formula

Storm Sewer Subcatchments (As per Drawing STM-1: Storm Drainage Plan)

	Catchment Area		Pervious	Impervious		TOTAL		SWM parameters		
Index	STM-1	SWM-2	Grass	Building	Paved		Run-off coef	Imperviousness	Ximp	SAR
	401		2,384	0	1,644	4,028	0.48	41%	41%	0%
	402		1,124	0	827	1,951	0.49	42%	42%	0%
	403		1,133	0	820	1,953	0.49	42%	42%	0%
	404		1,131	0	820	1,951	0.49	42%	42%	0%
	405		1,552	0	2,075	3,627	0.61	57%	57%	0%
		Total	7,324	0	6,186	**13,510**				

Pre-Development Catchments (As per SWM-1: Pre Development SWM Plan)

Type	Catchment Area		Pervious - m²	Impervious - m²		TOTAL		SWM parameters		
	Index	SWM-1	Grass	Building	Paved	m²	Run-off coef	Imperviousness	Ximp	SAR
Internal	101		268,040	842	437	269,319	0.16	0%	0%	66%
Internal	102		13,331	1,312	2,769	17,412	0.35	23%	16%	32%
		SubTotal	281,371	2,154	3,206	**286,731**				
	Block 6	Environmental Protection Area				83,126				
		Total				**369,857**				

Post-Development Catchments (As per Figure SWM-2: Post Development SWM Plan)

Type	Catchment Area		Pervious - m²	Impervious - m²		TOTAL		SWM parameters		
	Index	SWM-2	Grass	Building	Paved	m²	Run-off coef	Imperviousness	Ximp	SAR
External	1	301	22,890	0	9,810	**32,700**	0.40	30%	30%	0%
External	2	302	9,447	1,345	2,695	**13,487**	0.40	30%	20%	33%
External	3	303	91,600	0	0	**91,600**	0.16	0%	0%	
External	4	304	5,231	0	4,369	**9,600**	0.52	46%	46%	0%
External	5	305	813	0	1,517	**2,330**	0.67	65%	65%	0%
		Total	**129,981**	**1,345**	**18,391**	**149,717**				
Internal	6	201	13,741	15,287	15,357	**44,385**	0.71	69%	35%	50%
Internal	7	202	33,427	38,877	38,615	**110,919**	0.71	70%	35%	50%
Internal	8	203	13,061	19,158	19,454	**51,673**	0.75	75%	38%	50%
Internal	9	204	3,631	4,590	4,439	**12,659**	0.72	71%	35%	51%
Internal	10	205	3,689	4,467	4,335	**12,491**	0.72	70%	35%	51%
Internal	11	206	3,125	3,285	3,521	**9,931**	0.70	69%	35%	48%
Internal	12	207	7,314	0	6,196	**13,510**	0.52	46%	46%	0%
Internal	13	208	16,186	2,669	4,170	**23,025**	0.39	30%	18%	39%
Internal	14	209	8,138	0	0	**8,138**	0.16	0%	0%	
		SubTotal	**102,310**	**88,333**	**96,087**	**286,731**				
	Block 6	Environmental Protection Area				83,126				
		Total				**369,857**				

SWM	1	SWM	232,291	89,678	114,478	**436,448**	0.53	**46.8%**	26%	44%

Storm Water Management Facility
Hydraulic Calculation Sheet: Stage-Storage-Discharge

CLIENT: DELTINI Commercial Developments Inc. **DATE:** July 2024

PROJECT: 636040 Prince of Wales Road **DESIGN:** MG/VS

FILE: FRE-17110 (50) **CHECKED:** MF

Extended Detention Orifice		
RADIUS	0.075	m
Outlet Diameter	150.0	mm
Invert Height	1.50	m

Tertiary Orifice		
RADIUS	0.000	m
Outlet Dia		mm
Invert Height		m

Weir 1 Details - Rectangular Section		
Invert Height	3.20	m
Length	21.00	m
Coefficient	1.705 (Broad-Crested)	

Secondary Orifice		
RADIUS	0.450	m
Outlet Diameter	900.0	mm
Invert Height	2.05	m

Weir 1 Details - Triangular Section		
Invert Elevation	3.20	m
Sideslope	10	H:1V
Coefficient	1.2 (MTO DC 2.46)	

	Minimum		Provided		Elevation	
Total Permanent Pool Volume:	5651	m^3	8685	m^3	454.00	m
Extended Detention Volume:	1746	m^3	5192	m^3	454.55	m

POND AREA	TOTAL STORAGE	ACTIVE DETENTION STORAGE	WATER DEPTH	EXT. DET. ORIFICE FLOW	SECONDARY ORIFICE FLOW	TERTIARY ORIFICE FLOW	TRAPEZOIDAL WEIR WITH 4H:1V SIDESLOPES			TOTAL OUTFLOW	ELEVATION	
							TRIANGULAR SECTION	RECTANGULAR SECTION	TOTAL WEIR FLOW			
m^2	m^3	m^3	m	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m	
2015	0	0	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	452.50	**Bottom of Pond**
8250	8,685	0	1.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	454.00	**Permanent Pool**
8457	9,103	418	1.55	0.002	0.000	0.000	0.000	0.000	0.000	0.002	454.05	
8665	9,531	846	1.60	0.008	0.000	0.000	0.000	0.000	0.000	0.008	454.10	
8875	9,969	1,284	1.65	0.013	0.000	0.000	0.000	0.000	0.000	0.013	454.15	
9086	10,418	1,733	1.70	0.017	0.000	0.000	0.000	0.000	0.000	0.017	454.20	
9298	10,878	2,193	1.75	0.021	0.000	0.000	0.000	0.000	0.000	0.021	454.25	
9512	11,348	2,663	1.80	0.023	0.000	0.000	0.000	0.000	0.000	0.023	454.30	
9727	11,829	3,144	1.85	0.026	0.000	0.000	0.000	0.000	0.000	0.026	454.35	25mm 4hr CHI (454.36m)
9944	12,321	3,636	1.90	0.028	0.000	0.000	0.000	0.000	0.000	0.028	454.40	
10135	12,823	4,138	1.95	0.030	0.000	0.000	0.000	0.000	0.000	0.030	454.45	
10824	13,334	4,649	2.00	0.032	0.000	0.000	0.000	0.000	0.000	0.032	454.50	
10919	13,877	5,192	2.05	0.034	0.000	0.000	0.000	0.000	0.000	0.034	454.55	**Extended Detention**
11014	14,426	5,741	2.10	0.036	0.088	0.000	0.000	0.000	0.000	0.124	454.60	2yr 4hr CHI (454.55m)
11109	14,979	6,294	2.15	0.037	0.097	0.000	0.000	0.000	0.000	0.134	454.65	
11204	15,537	6,851	2.20	0.039	0.100	0.000	0.000	0.000	0.000	0.139	454.70	5yr 4hr CHI (454.72m)
11300	16,099	7,414	2.25	0.040	0.107	0.000	0.000	0.000	0.000	0.147	454.75	2yr 24hr SCS (454.75m)
11396	16,667	7,981	2.30	0.042	0.119	0.000	0.000	0.000	0.000	0.160	454.80	
11492	17,239	8,554	2.35	0.043	0.136	0.000	0.000	0.000	0.000	0.180	454.85	10yr 4hr CHI (454.85m)
11588	17,816	9,131	2.40	0.045	0.160	0.000	0.000	0.000	0.000	0.205	454.90	
11685	18,398	9,712	2.45	0.046	0.189	0.000	0.000	0.000	0.000	0.235	454.95	25yr 4hr CHI (455.01m)
11781	18,984	10,299	2.50	0.047	0.224	0.000	0.000	0.000	0.000	0.272	455.00	5yr 24hr SCS (455.02m)
11879	19,576	10,891	2.55	0.049	0.397	0.000	0.000	0.000	0.000	0.445	455.05	50yr 4hr CHI (455.07m)
11976	20,172	11,487	2.60	0.050	0.561	0.000	0.000	0.000	0.000	0.611	455.10	100yr 4hr CHI (455.13m)
12073	20,773	12,088	2.65	0.051	0.687	0.000	0.000	0.000	0.000	0.738	455.15	10yr 24hr SCS (455.13m)
12171	21,379	12,694	2.70	0.052	0.794	0.000	0.000	0.000	0.000	0.846	455.20	
12269	21,990	13,305	2.75	0.053	0.887	0.000	0.000	0.000	0.000	0.941	455.25	
12368	22,606	13,921	2.80	0.055	0.972	0.000	0.000	0.000	0.000	1.026	455.30	25yr 24hr SCS (455.30m)
12466	23,227	14,542	2.85	0.056	1.050	0.000	0.000	0.000	0.000	1.105	455.35	
12565	23,853	15,168	2.90	0.057	1.122	0.000	0.000	0.000	0.000	1.179	455.40	
12664	24,484	15,799	2.95	0.058	1.190	0.000	0.000	0.000	0.000	1.248	455.45	50yr 24hr SCS (455.45m)
12764	25,119	16,434	3.00	0.059	1.255	0.000	0.000	0.000	0.000	1.314	455.50	
12863	25,760	17,075	3.05	0.060	1.316	0.000	0.000	0.000	0.000	1.376	455.55	
12963	26,406	17,721	3.10	0.061	1.374	0.000	0.000	0.000	0.000	1.435	455.60	100yr 24hr SCS (455.60m)
13063	27,056	18,371	3.15	0.062	1.431	0.000	0.000	0.000	0.000	1.492	455.65	
13163	27,712	19,027	3.20	0.063	1.485	0.000	0.000	0.000	0.000	1.547	455.70	**Overflow Weir**
13264	28,373	19,688	3.25	0.064	1.537	0.000	0.007	0.400	0.407	2.007	455.75	Timmins (455.77m)
13365	29,038	20,353	3.30	0.065	1.587	0.000	0.038	1.132	1.170	2.822	455.80	
13466	29,709	21,024	3.35	0.066	1.636	0.000	0.105	2.080	2.185	3.886	455.85	
13567	30,385	21,700	3.40	0.067	1.683	0.000	0.215	3.202	3.417	5.167	455.90	
13669	31,066	22,381	3.45	0.067	1.729	0.000	0.375	4.476	4.851	6.648	455.95	
13770	31,752	23,067	3.50	0.068	1.774	0.000	0.592	5.883	6.475	8.318	456.00	
15064	32,472	23,787	3.55	0.069	1.818	0.000	0.870	7.414	8.284	10.171	456.05	
16396	33,259	24,574	3.60	0.070	1.861	0.000	1.214	9.058	10.272	12.203	456.10	**Top of Pond**

Cells from elevations 252.55m to 253.95m have been hidden.

Orifice Outflow equation is for orifice flow given by:

$Q=0.63A(2gH)^{0.5}$ Where ponding elevation is above orifice centroid

$Q=1.65\{[(\pi D^2/4)([2\cos^{-1}\{[(D/2)-H]/[D/2]\}\{180/\pi\}]/360)-([\{D/2\}-H][DH-H^2]\ ^\wedge\ [1/2])/H]\}H\ ^\wedge\ (1.5)$ Where ponding elevation is at or below orifice centroid

Flow over the top of the weir is given by weir flow

$Q=1.705LH^{1.5}$ Where the weir is rectangular in shape

$Q=1.2*\tan(angle/2)*H^{2.5}$ Where the weir is triangular in shape

Where: Q=flow m^3/s

H=head m

Orifice head measured from water depth to orifice centroid (where ponding elevation is above orifice centroid).
Orifice head measured from water depth to orifice invert (where ponding elevation is at or below orifice centroid).

H = Weir head = depth from weir crest to water level
D=orifice diameter m
L=weir length m
g=9.81 m/s^2
A=Area of orifice opening m^2

Shaded rows were entered into OTTHYMO pond rating curve.

Storm Water Management Facility
SWMF Quality Design Notes

CLIENT: DELTINI Commercial Developments Inc.
DATE: July 2024
PROJECT: 636040 Prince of Wales Road
DESIGN: MG
FILE: FRE-17110 (50)
CHECKED: MF

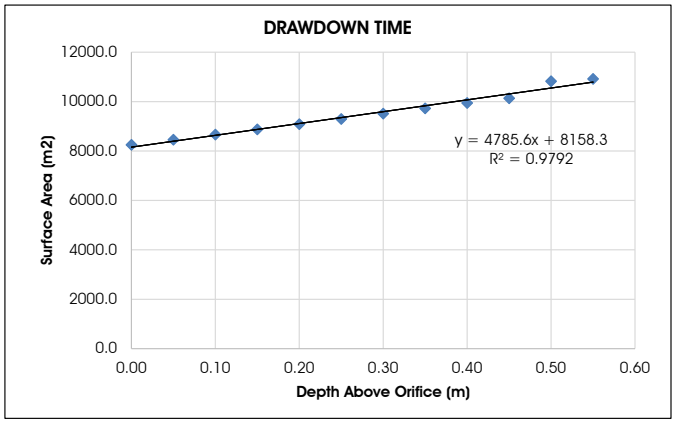
	Area (ha)	TIMP(%)
Total area draining into the SWMF	43.64	46.8%
Post Development Drainage Area	43.64	46.8%

Permanent Pool and Extended Detention Volumes:

Drainage Area	43.64	ha
Imperviousness	46.8%	

	Wet Pond
Imperviousness	Storage Vol.
0%	65 m^3/ha
35%	140 m^3/ha
55%	190 m^3/ha
70%	225 m^3/ha
85%	250 m^3/ha
100%	290 m^3/ha

Excerpt - MOE Table 3.2, March 2003



Volumetric Criteria:

Total Water Quality Volumetric Criteria	169.5	m^3/ha
Extended Detention Volumetric Criteria	40.0	m^3/ha
Permanent Pool Volumetric Criteria	129.5	m^3/ha

Source & Notes:
Conducted linear interpolation from MOE Table 3.2 for Enhanced Protection level wet pond.
MOE Section 3.3.2
MOE Section 3.3.2

SWMF Volume Requirements:

Total Water Quality Volume (WQV) Required	7397	m^3
Extended Detention Storage Volume Required	1746	m^3/s
Permanent Pool Storage Volume Required	5651	m^3
Extended Detention Volume Provided	5192	m^3
Permanent Pool Storage Volume Provided	8685	m^3
Total Water Quality Volume Provided	13877	m^3
OTTHYMO 25mm 4hr CHI Water Quality Volume	3240	m^3

Based on Eqn. 4.11 MOE SWM Planning and Design Manual

Hydraulic Detention Time		
Intercept of Regression, C3	8158.3	
Slope of Regression, C2	4785.6	
Orifice Area	0.0177	m^2
Invert Secondary Orifice Elevation	454.55	m
Depth over Primary Orifice Centroid (WQV WL)	0.475	m
Drawdown Time - Ultimate Ponding Level	252,681	Sec
	70.2	Hours
25mm Event Elevation	454.36	m
Depth over Orifice (WQV WL)	0.285	m
Drawdown Time - 25mm Event Ponding Level	189,134	Sec
	52.5	Hours

SWMF Drawdown Requirements:

Minimum Drawdown Time, MOE Table 4.8	24	Hours
Preferred Drawdown Time, MOE Table 4.8	48	Hours

SWMF Forebay Requirements:

Forebay Length Provided	160	m
Forebay Depth Provided	1.50	m
Forebay Length : Width Ratio Provided	10	:1
Minimum Forebay Length, MOE Table 4.8	39.9	m
Minimum Forebay Depth, MOE Table 4.8	1.00	m
Preferred Forebay Depth, MOE Table 4.8	1.50	m
Minimum Forebay L : W, MOE Table 4.8	2.00	:1
Preferred Forebay L : W, MOE Table 4.8	4.00 - 5.00	:1

Forebay Calculations:

MOE Equation 4.5 - Forebay Settling Length

Dist = SQRT((r*Q_p)/V_s)

Forebay Length Required	Dist	30.6	m
Length-to-width ratio of forebay	r	10	:1
Q_p from the pond during design quality storm	Q_p	0.028	m^3/s
Settling velocity	V_s	0.0003	m/s

MOE Equation 4.6 - Dispersion Length

Dist = (8*Q)/(d*Vf)

Length of dispersion	Dist	39.9	m
Inlet (Pipe Capacity) flowrate-5 yr	Q	3.739	m^3/s
Depth of the permanent pool in the forebay	d	1.50	m
Desired velocity in the forebay	Vf	0.50	m/s

Design Criteria Check:

Is Max. Required WQV Met?	YES
Is Min. Required Drawdown Time Met?	YES
Is Preferred Drawdown Time Met?	YES
Is Required Forebay Length Provided?	YES
Is Minimum Forebay Depth Provided?	YES
Is Preferred Forebay Depth Provided?	YES
Is Minimum L : W Ratio Provided?	YES
Is Preferred L : W Ratio Provided?	YES

Additional Notes:

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 27 2023

FRE-17110 - 25mm 4hr CHI - North Channel Conveyance

Trapezoidal

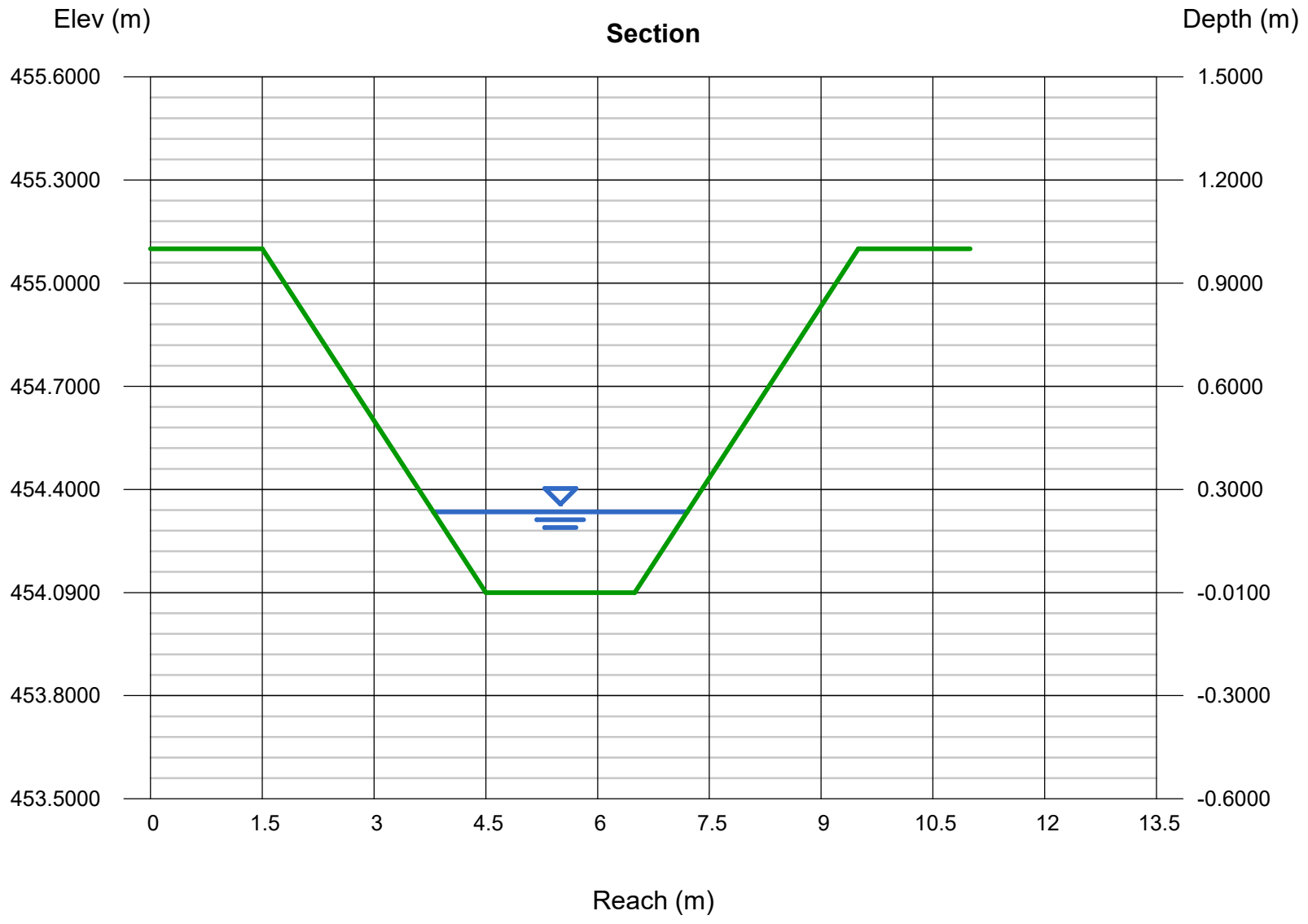
Bottom Width (m)	= 2.0000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 1.0000
Invert Elev (m)	= 454.1000
Slope (%)	= 0.5000
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cms)	= 0.4030

Highlighted

Depth (m)	= 0.2347
Q (cms)	= 0.4030
Area (sqm)	= 0.6346
Velocity (m/s)	= 0.6350
Wetted Perim (m)	= 3.4843
Crit Depth, Yc (m)	= 0.1494
Top Width (m)	= 3.4082
EGL (m)	= 0.2553



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 27 2023

FRE-17110 - 100yr 24hr SCS - North Channel Conveyance

Trapezoidal

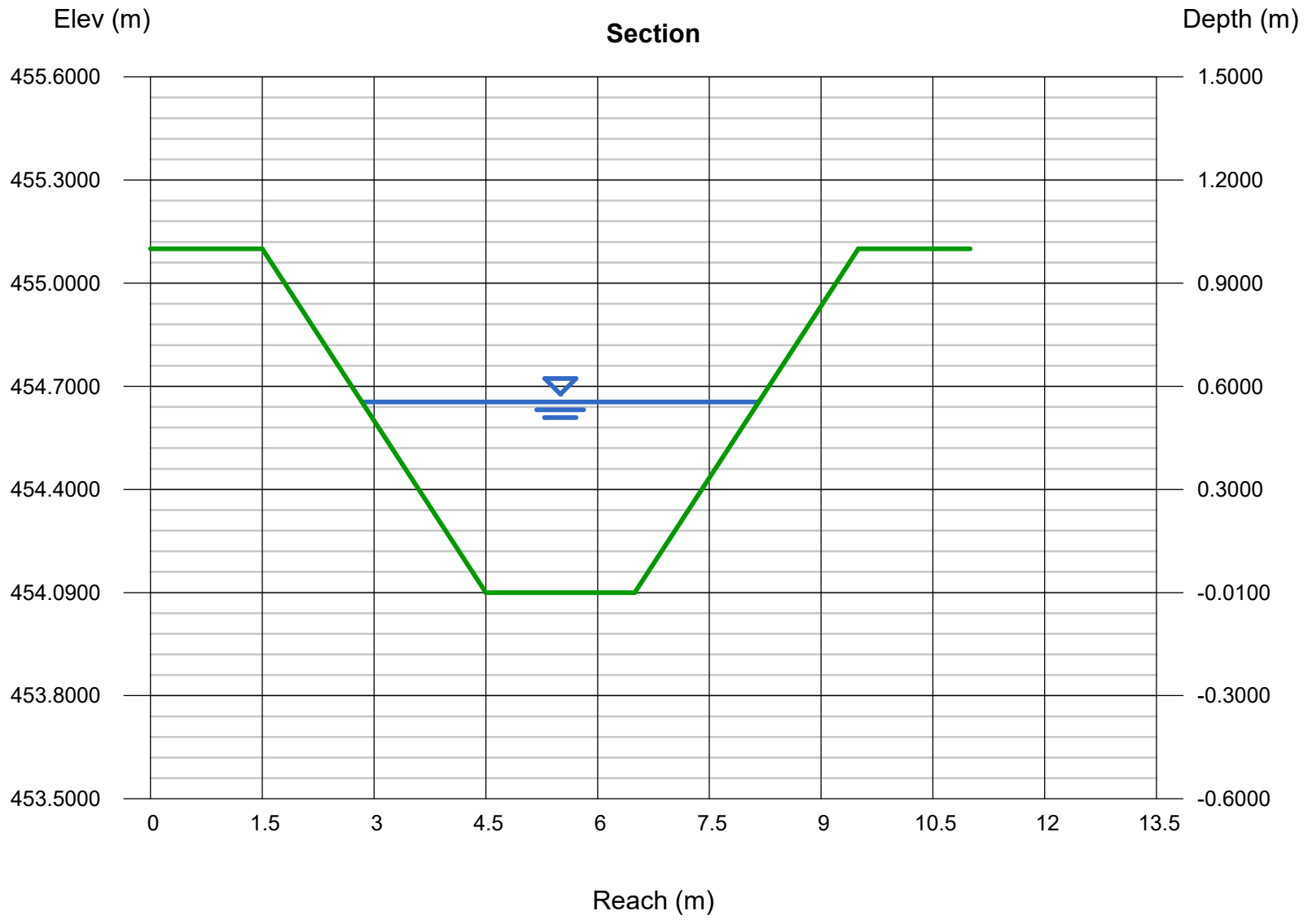
Bottom Width (m)	= 2.0000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 1.0000
Invert Elev (m)	= 454.1000
Slope (%)	= 0.5000
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cms)	= 2.1090

Highlighted

Depth (m)	= 0.5547
Q (cms)	= 2.1090
Area (sqm)	= 2.0327
Velocity (m/s)	= 1.0375
Wetted Perim (m)	= 5.5085
Crit Depth, Yc (m)	= 0.3962
Top Width (m)	= 5.3284
EGL (m)	= 0.6096



636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *Refer to Hydroflow express printout titled "FRE-17110 - 100yr 24hr SCS - North Channel Conveyance" in PSWM&FSR* ***Appendix B*** *.*

Flow rate has been extracted from the 100 year 24 hour SCS Peak Flow OTTHYMO model.

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG

CHECKED BY: MF

CHANNEL GEOMETRY

SWMF North Channel Inlet			
Channel Slope (S)	0.005	m/m	average slope
Bottom Width (b_w)	2	m	
Side Slope (Left)	3	:1 (H:V)	
Side Slope (Right)	3	:1 (H:V)	
Wetted Perimeter (P_w)	5.508	m	
Hydraulic Radius (R)	0.369	m	
Normal Depth (y)	0.5547	m	
Velocity (V)	1.0375	m/s	
Discharge (Q)	2.109	m^3/s	
Froude Number (F)	0.54		
Flow Type	subcritical flow		

TRACTIVE FORCES - Channel Bed

$\tau_{b\,max} = K_b * \gamma * R * S$

Where: $K_b = (Z/2)^{0.14}\,[1.42 - 0.019 \ln (b_w / y)^3]$ or MTO Design Chart No. 2.11

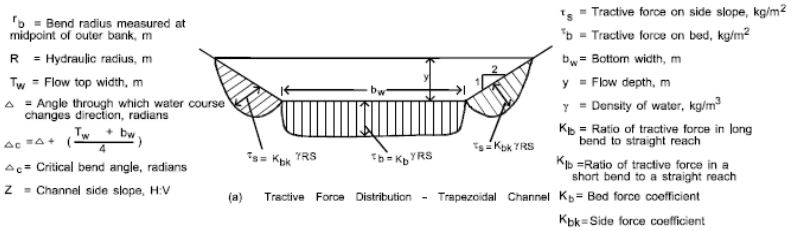
$\tau_{b\,max}$ = maximum tractive bed stress (N/m^2)
K_b = tractive force coefficient (bed), MTO Design Chart 2.11
γ = unit weight of water (9810 N/m^3)
R = hydraulic radius (m)
S = channel slope (m/m)

SWMF North Channel Inlet

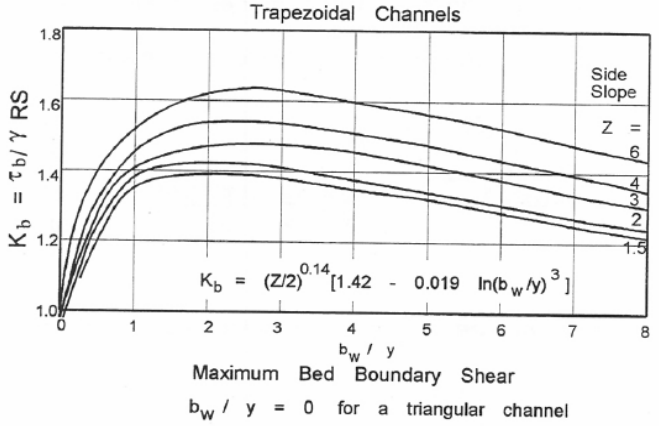
K_b =	1.43	
γ =	9810	N/m^3
R =	0.369	m
S =	0.005	m/m

$\tau_{b\,max}$ =	**25.80 N/m^2**

Figure 5.32: Tractive Force Distribution



Design Chart 2.11: Coefficients of Boundary Shear on Channel Bed



636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *Refer to Hydroflow express printout titled "FRE-17110 - 100yr 24hr SCS - North Channel Conveyance" in PSWM&FSR* ***Appendix B*** *.*

Flow rate has been extracted from the 100 year 24 hour SCS Peak Flow OTTHYMO model.

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG

CHECKED BY: MF

TRACTIVE FORCES - Channel Banks

$\tau_{s\,max} = K_{bk} * \gamma * R * S$

Where: $K_b = (Z/2)^{0.36}$ [1.3 - 0.15 ln (b_w / y)] or MTO Design Chart No. 2.12

$\tau_{s\,max}$ = maximum tractive bank stress (N/m^2)
K_{bk} = tractive force coefficient (bank), MTO Design Chart 2.12
γ = unit weight of water (9810 N/m^3)
R = hydraulic radius (m)
S = channel slope (m/m)

SWMF North Channel Inlet

K_b = 1.28
γ = 9810 N/m^3
R = 0.3690 m
S = 0.005 m/m

$\tau_{b\,max}$ =	**23.20 N/m^2**

RESISTIVE FORCES - Channel Bed

$\tau_{cb} = 0.0642 * D_{50}$

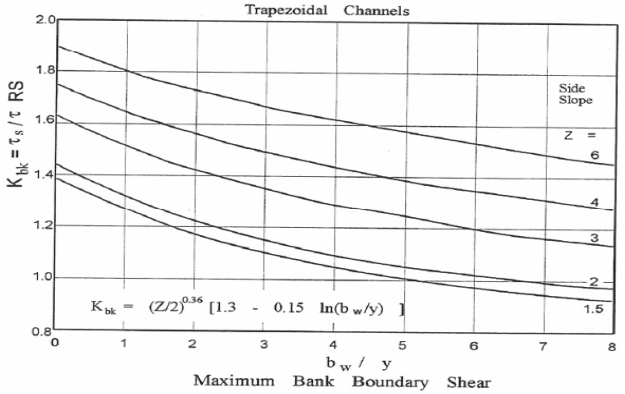
Where: τ_{cb} = critical side Shear Stress of particles on Channel Bed (kg/m^2)
D_{50} = median particle size (mm)

SWMF North Channel Inlet

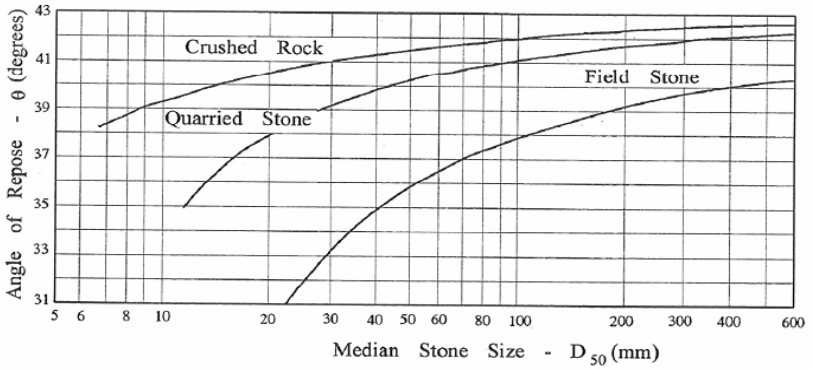
D_{50} = 150 mm dia. Rip Rap

τ_{cb} =	**9.63 (kg/m^2)**
or	**94.47 N/m^2**

Design Chart 2.12: Coefficients of Boundary Shear on the Side Slope



Design Chart 2.13: Determining Angle of Repose



636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *Refer to Hydroflow express printout titled "FRE-17110 - 100yr 24hr SCS - North Channel Conveyance" in PSWM&FSR* ***Appendix B*** *.*

Flow rate has been extracted from the 100 year 24 hour SCS Peak Flow OTTHYMO model.

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG

CHECKED BY: MF

RESISTIVE FORCES - Channel Banks

$\tau_{cs} = K_{cs} * \tau_{cb}$

Where: $K_{cs} = (1 - (\sin^2\theta / \sin^2\phi))^{0.5}$

θ = Channel Side Slope Angle

ϕ = Angle of Repose of Bank Material (MTO Design Chart 2.13

θ = 18.43 ° (Critical Bank Where Z=3)

ϕ = 42.30 °

K_{cs} = 0.912

τ_{cb} = 94.47 N/m^2

SWMF North Channel Inlet

τ_{cs} =	**86.17 N/m^2**

SUMMARY		
	Channel Boundary Shear Stress (N/m^2)	Channel Boundary Shear Stress (N/m^2)
Channel Bed	25.80	94.47
Channel Banks	23.20	86.17

The shear stresses in the channel are less that the maximum resistances of the channel lining. Therefore the designed channel lining is appropriate.

Design Chart 2.16: Permissible Shear for Lining Materials

Vegetative			Permissible Unit Shear Stress (kg / m^2)	
Class A			18	
Class B			10	
Class C			4.9	
Class D			2.9	
Class E			1.7	
Gravel Riprap	1"	25 mm	1.6	Estimates only. Permissible shear stress is dependent on several factors including flow depth, velocity, bank side slope, etc.
	2"	50 mm	3.2	
Rock Riprap	6"	150 mm	9.8	
	12"	300 mm	20	

Note: Class A, B, C, D and E shown on Design Chart 2.23

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 27 2023

FRE-17110 - 100yr 24hr SCS - South Channel Conveyance

Trapezoidal

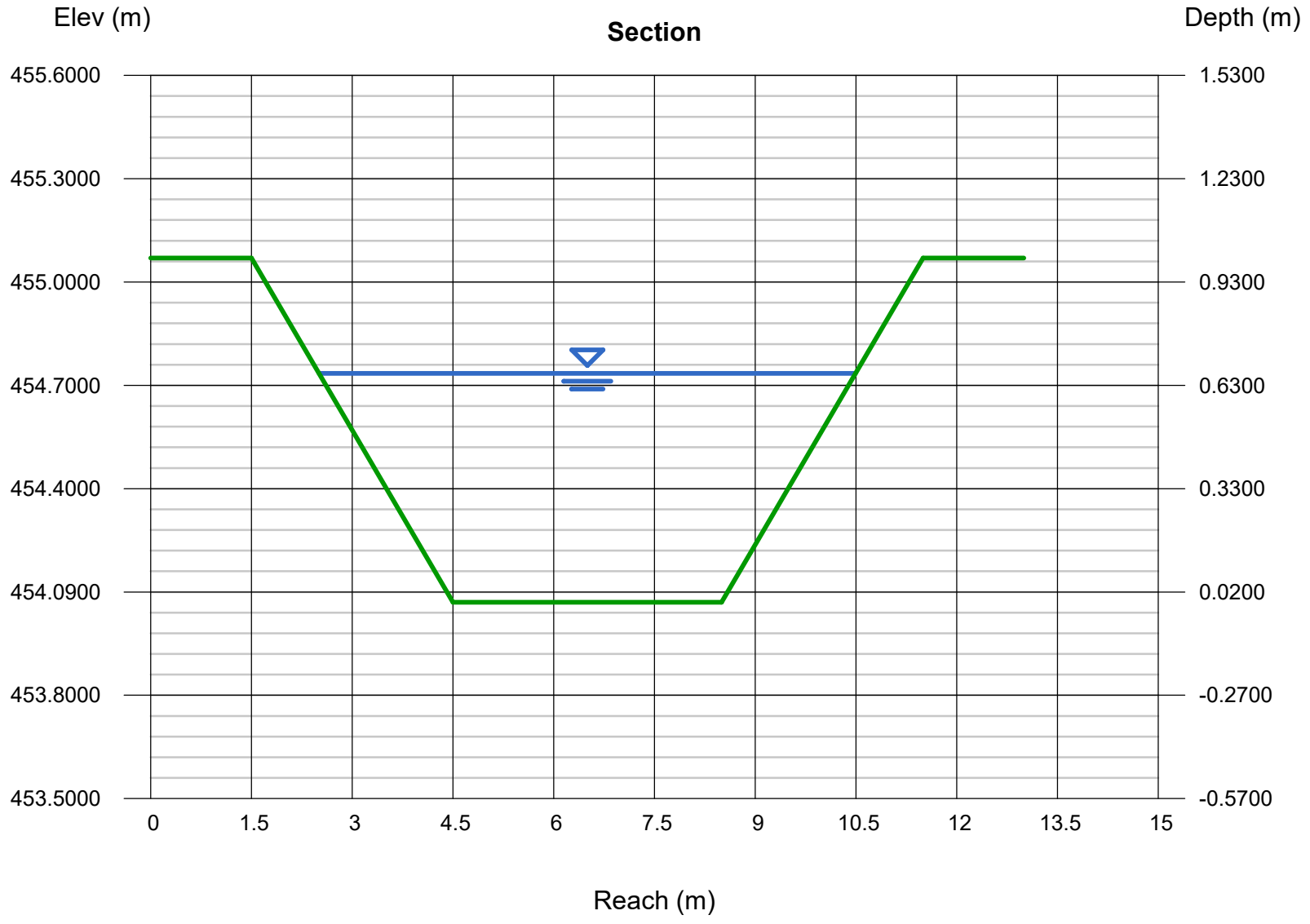
Bottom Width (m)	= 4.0000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 1.0000
Invert Elev (m)	= 454.0700
Slope (%)	= 0.5000
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cms)	= 4.9320

Highlighted

Depth (m)	= 0.6645
Q (cms)	= 4.9320
Area (sqm)	= 3.9824
Velocity (m/s)	= 1.2384
Wetted Perim (m)	= 8.2024
Crit Depth, Yc (m)	= 0.4755
Top Width (m)	= 7.9868
EGL (m)	= 0.7427



636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *Refer to Hydroflow express printout titled "FRE-17110 - 100yr 24hr SCS - South Channel Conveyance" in PSWM&FSR* ***Appendix B*** *.*

Flow rate has been extracted from the 100 year 24 hour SCS Peak Flow OTTHYMO model.

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG

CHECKED BY: MF

CHANNEL GEOMETRY

SWMF South Channel Inlet			
Channel Slope (S)	0.005	m/m	average slope
Bottom Width (b_w)	4	m	
Side Slope (Left)	3	:1 (H:V)	
Side Slope (Right)	3	:1 (H:V)	
Wetted Perimeter (P_w)	8.203	m	
Hydraulic Radius (R)	0.486	m	
Normal Depth (y)	0.6645	m	
Velocity (V)	1.2384	m/s	
Discharge (Q)	4.932	m^3/s	
Froude Number (F)	0.56		
Flow Type	subcritical flow		

TRACTIVE FORCES - Channel Bed

$\tau_{b\,max} = K_b * \gamma * R * S$

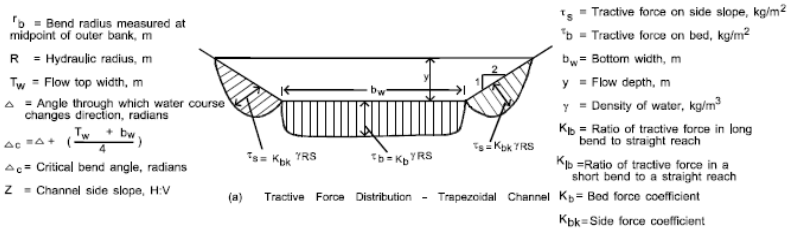
Where: $K_b = (Z/2)^{0.14}\,[1.42 - 0.019\,\ln(b_w / y)^3]$ or MTO Design Chart No. 2.11

$\tau_{b\,max}$ = maximum tractive bed stress (N/m^2)
K_b = tractive force coefficient (bed), MTO Design Chart 2.11
γ = unit weight of water (9810 N/m^3)
R = hydraulic radius (m)
S = channel slope (m/m)

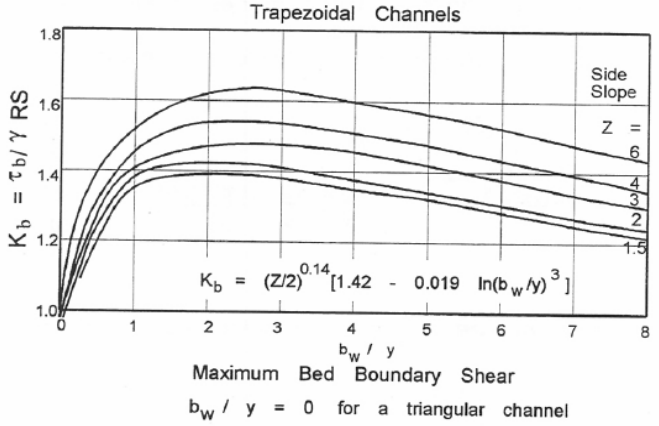
SWMF South Channel Inlet

K_b =	1.39	
γ =	9810	N/m^3
R =	0.486	m
S =	0.005	m/m
$\tau_{b\,max}$ =	**33.21**	**N/m^2**

Figure 5.32: Tractive Force Distribution



Design Chart 2.11: Coefficients of Boundary Shear on Channel Bed



636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *Refer to Hydroflow express printout titled "FRE-17110 - 100yr 24hr SCS - South Channel Conveyance" in PSWM&FSR* ***Appendix B*** *.*

Flow rate has been extracted from the 100 year 24 hour SCS Peak Flow OTTHYMO model.

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG

CHECKED BY: MF

TRACTIVE FORCES - Channel Banks

$\tau_{s\,max} = K_{bk} * \gamma * R * S$

Where: $K_b = (Z/2)^{0.36}$ [1.3 - 0.15 ln (b_w / y)] or MTO Design Chart No. 2.12

$\tau_{s\,max}$ = maximum tractive bank stress (N/m^2)
K_{bk} = tractive force coefficient (bank), MTO Design Chart 2.12
γ = unit weight of water (9810 N/m^3)
R = hydraulic radius (m)
S = channel slope (m/m)

SWMF South Channel Inlet

K_b = 1.19
γ = 9810 N/m^3
R = 0.4855 m
S = 0.005 m/m

$\tau_{b\,max}$ =	**28.41 N/m^2**

RESISTIVE FORCES - Channel Bed

$\tau_{cb} = 0.0642 * D_{50}$

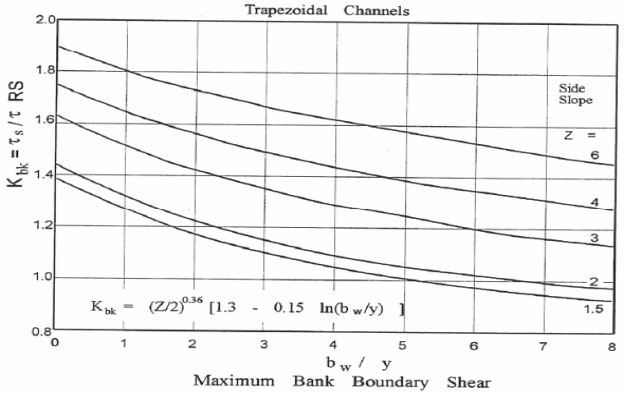
Where: τ_{cb} = critical side Shear Stress of particles on Channel Bed (kg/m^2)
D_{50} = median particle size (mm)

SWMF South Channel Inlet

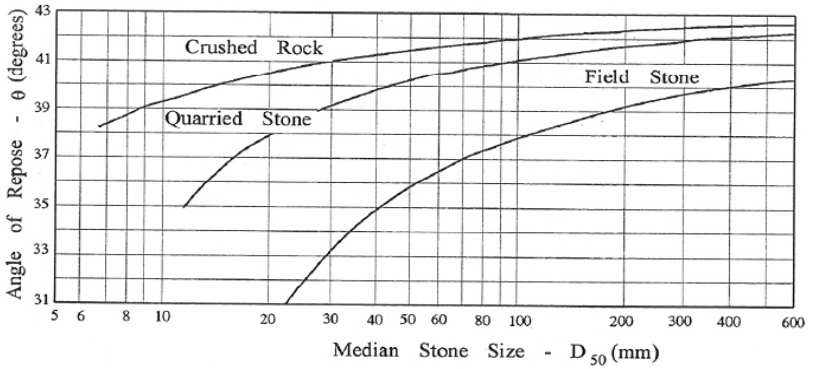
D_{50} = 150 mm dia. Rip Rap

τ_{cb} =	**9.63 (kg/m^2)**
or	**94.47 N/m^2**

Design Chart 2.12: Coefficients of Boundary Shear on the Side Slope



Design Chart 2.13: Determining Angle of Repose



636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *Refer to Hydroflow express printout titled "FRE-17110 - 100yr 24hr SCS - South Channel Conveyance" in PSWM&FSR* ***Appendix B*** *.*

Flow rate has been extracted from the 100 year 24 hour SCS Peak Flow OTTHYMO model.

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG

CHECKED BY: MF

RESISTIVE FORCES - Channel Banks

$\tau_{cs} = K_{cs} * \tau_{cb}$

Where: $K_{cs} = (1 - (\sin^2\theta / \sin^2\phi))^{0.5}$

θ = Channel Side Slope Angle

ϕ = Angle of Repose of Bank Material (MTO Design Chart 2.13

θ = 18.43 ° (Critical Bank Where Z=3)

ϕ = 42.30 °

K_{cs} = 0.912

τ_{cb} = 94.47 N/m^2

SWMF South Channel Inlet

τ_{cs} =	**86.17 N/m^2**

SUMMARY		
	Channel Boundary Shear Stress (N/m^2)	Channel Boundary Shear Stress (N/m^2)
Channel Bed	33.21	94.47
Channel Banks	28.41	86.17

The shear stresses in the channel are less that the maximum resistances of the channel lining. Therefore the designed channel lining is appropriate.

Design Chart 2.16: Permissible Shear for Lining Materials

Vegetative			Permissible Unit Shear Stress (kg / m^2)	
Class A			18	
Class B			10	
Class C			4.9	
Class D			2.9	
Class E			1.7	
Gravel Riprap	1"	25 mm	1.6	Estimates only. Permissible shear stress is dependent on several factors including flow depth, velocity, bank side slope, etc.
	2"	50 mm	3.2	
Rock Riprap	6"	150 mm	9.8	
	12"	300 mm	20	

Note: Class A, B, C, D and E shown on Design Chart 2.23

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 27 2023

FRE-17110 - SWMF EOW Chanel Lining at 3:1 Slope

Trapezoidal

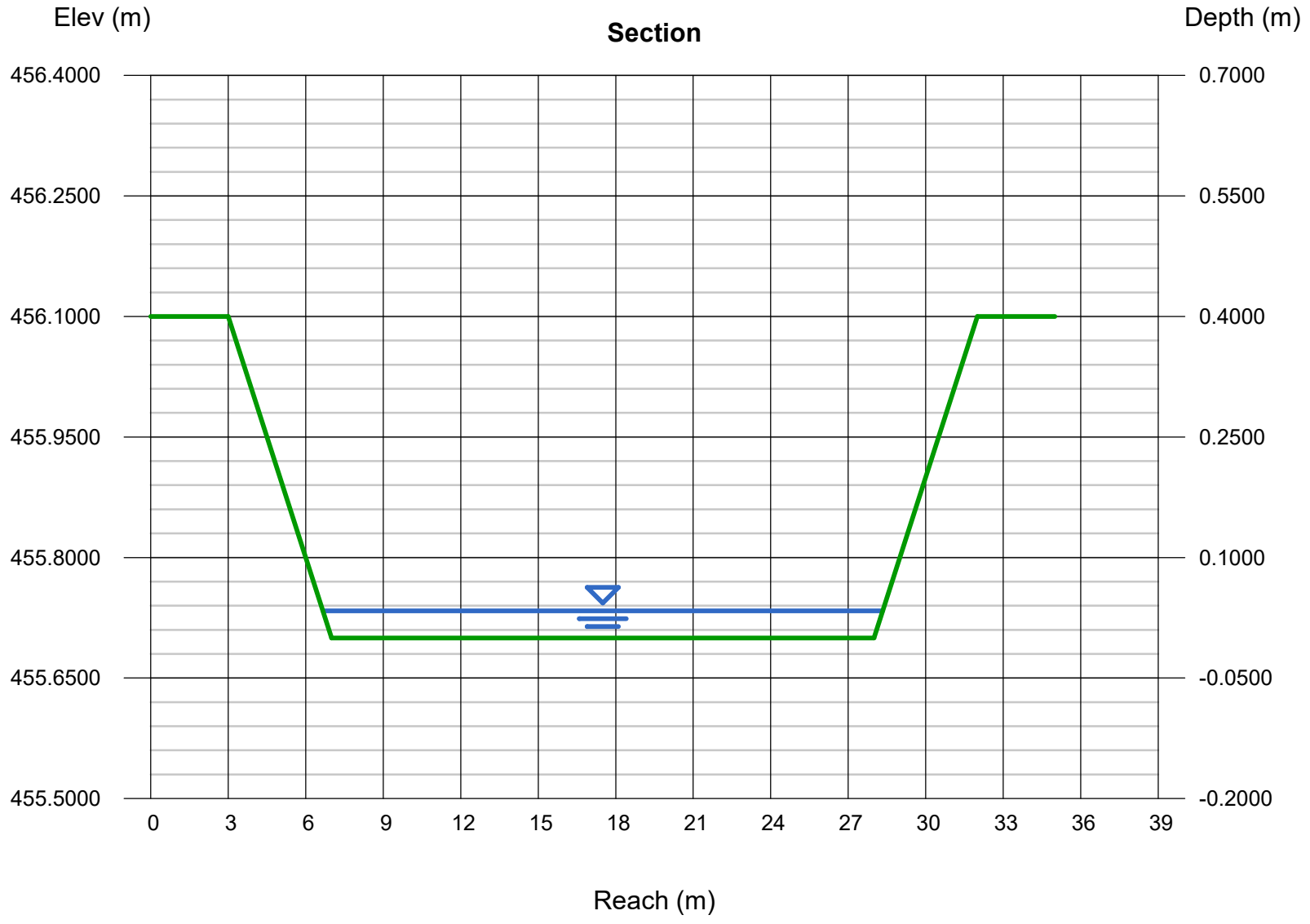
Bottom Width (m)	= 21.0000
Side Slopes (z:1)	= 10.0000, 10.0000
Total Depth (m)	= 0.4000
Invert Elev (m)	= 455.7000
Slope (%)	= 33.3300
N-Value	= 0.055

Calculations

Compute by:	Known Q
Known Q (cms)	= 0.7120

Highlighted

Depth (m)	= 0.0335
Q (cms)	= 0.7120
Area (sqm)	= 0.7153
Velocity (m/s)	= 0.9953
Wetted Perim (m)	= 21.6739
Crit Depth, Yc (m)	= 0.0488
Top Width (m)	= 21.6706
EGL (m)	= 0.0841



636040 Prince of Wales Road

Emergency Overflow Weir Capacity

CLIENT: DELTINI Commercial Developments Inc. **DATE:** July 2024

PROJECT: 636040 Prince of Wales Road **DESIGN:** MG

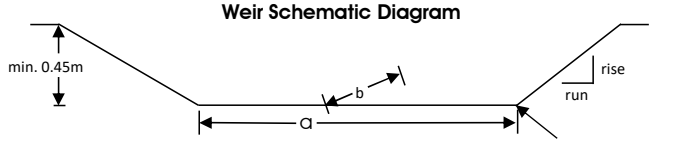
FILE: FRE-17110 (50) **CHECKED:** MF

Trapezoidal Weir Flow Capacity Calculator

Input:

Weir sill length, a:	21	m
Weir side slopes:	10	:1 (run:rise)
Maximum flow depth:	0.40	m
Weir width (in direction of flow), b:	7.4	m
H/L:	0.054	Good H/L <0.6

Weir Schematic Diagram



Where; a= 21.0 Bottom of weir (m): 455.70

b= 7.4

run: rise= 10:1

Calculated:

NVCA 9.9.2 **Rectangular 'C' Equation**

$y=(a+bx)/(1+cx+dx^2)$

a = -10383.49
b = 3418997
c = 2131595.1
d = -235014.2

NVCA 9.9.3 **Triangular 'C' Equation**

$y=(a+bx)/(1+cx+dx^2)$

a = -1.0071E-05
b = 143.5986704
c = 114.5046511
d = -4.76857422

x=depth of flow/weir width in the direction of flow

Rectangular C= 1.523 Triangular C= 1.082

NVCA 9.9.2 + 9.9.3: **Rectangular Broad Crested Weir + Trapazoidal Broad Crested Weir Equation**

$Q = (C*L*(H^{3/2})) + (C*(H^{5/2})*\tan(\theta/2))$

θ= 168.5789 2.942 radians

Maximum weir flow	**9.185**	m^3/s
Weir velocity	**0.919**	m/s
$Q_{Hazel - Weir}$	**0.712**	m^3/s

The peak flow overtopping the emergency overflow weir was determined by using linear interpolation.

Therefore the emergency overflow weir has sufficient capacity to convey the regional event to Primrose Creek.

Maximum ponding during regional event **455.77** m

Overtopping EOW Flow **0.712** m^3/s

SWMF Stage-Storage-Discharge Statistics			
Q EOW	0.407 m^3/s	at elev.	455.75
Q EOW	1.170 m^3/s	at elev.	455.80

636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *SWMF Emergency Overflow Weir and Spillway immediately downstream of SWMF. Refer to Hydraflow Express Report titled "FRE-17110 - SWMF EOW Channel Lining at 3:1 Slope" in the PSWM&FSR,* ***Appendix B*** *.*

Flow rate has been interpolated from model results. Please see EOW Capacity Calculation for details.

CLIENT: DELTINI Commercial Developments Inc. **DATE:** July 2024

PROJECT: 636040 Prince of Wales Road **DESIGN:** MG

FILE: FRE-17110 (50) **CHECKED BY:** MF

CHANNEL GEOMETRY

SWMF Emergency Overflow Channel		
Channel Slope (S)	0.3333	m/m
Bottom Width (b_w)	21	m
Side Slope (Left)	10	:1 (H:V)
Side Slope (Right)	10	:1 (H:V)
Wetted Perimeter (P_w)	22.407	m
Hydraulic Radius (R)	0.068	m
Normal Depth (y)	0.07	m
Velocity (V)	0.919	m/s
Discharge (Q)	0.712	m^3/s
Froude Number (F)	0.575	
Flow Type	subcritical flow	

TRACTIVE FORCES - Channel Bed

$\tau_{b\,max} = K_b * \gamma * R * S$

Where: $K_b = (Z/2)^{0.14}\,[1.42 - 0.019 \ln (b_w / y)^3\,]$ or MTO Design Chart No. 2.11

$\tau_{b\,max}$ = maximum tractive bed stress (N/m^2)

K_b = tractive force coefficient (bed), MTO Design Chart 2.11

γ = unit weight of water (9810 N/m^3)

R = hydraulic radius (m)

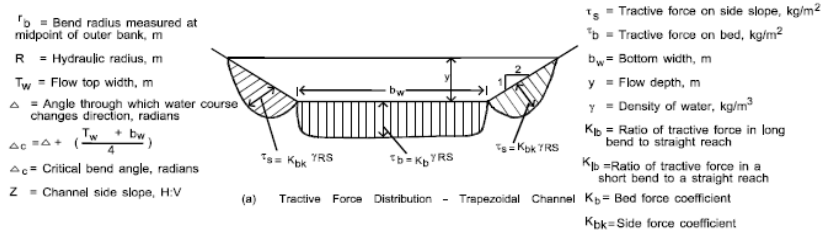
S = channel slope (m/m)

SWMF Emergency Overflow Channel

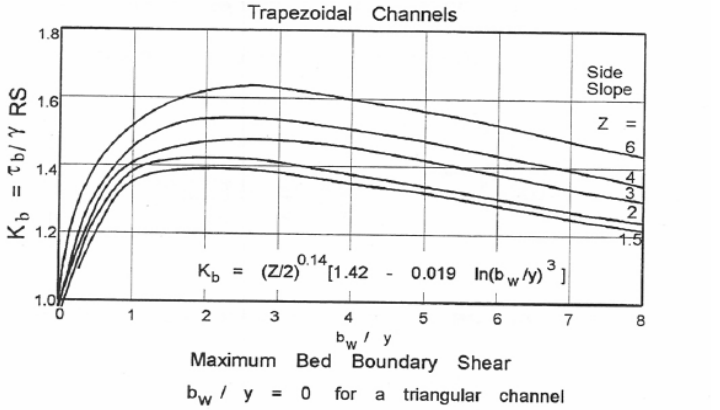
K_b =	1.37
γ =	9810 N/m^3
R =	0.068 m
S =	0.3333 m/m

$\tau_{b\,max}$ =	**304.02 N/m^2**

Figure 5.32: Tractive Force Distribution



Design Chart 2.11: Coefficients of Boundary Shear on Channel Bed



636040 Prince of Wales Road

Channel Lining & Erosion Protection Design

Notes: *SWMF Emergency Overflow Weir and Spillway immediately downstream of SWMF. Refer to Hydraflow Express Report titled "FRE-17110 - SWMF EOW Channel Lining at 3:1 Slope" in the PSWM&FSR,* ***Appendix B*** *.*

Flow rate has been interpolated from model results. Please see EOW Capacity Calculation for details.

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG

CHECKED BY: MF

TRACTIVE FORCES - Channel Banks

$\tau_{s\,max} = K_{bk} * \gamma * R * S$

Where: $K_b = (Z/2)^{0.36}\,[1.3 - 0.15\,\ln(b_w / y)]$ or MTO Design Chart No. 2.12

$\tau_{s\,max}$ = maximum tractive bank stress (N/m^2)
K_{bk} = tractive force coefficient (bank), MTO Design Chart 2.12
γ = unit weight of water (9810 N/m^3)
R = hydraulic radius (m)
S = channel slope (m/m)

SWMF Emergency Overflow Channel

K_b = 0.79
γ = 9810 N/m^3
R = 0.068 m
S = 0.3333 m/m

$\tau_{b\,max}$ = 175.84 N/m^2

RESISTIVE FORCES

SWMF Emergency Overflow Channel

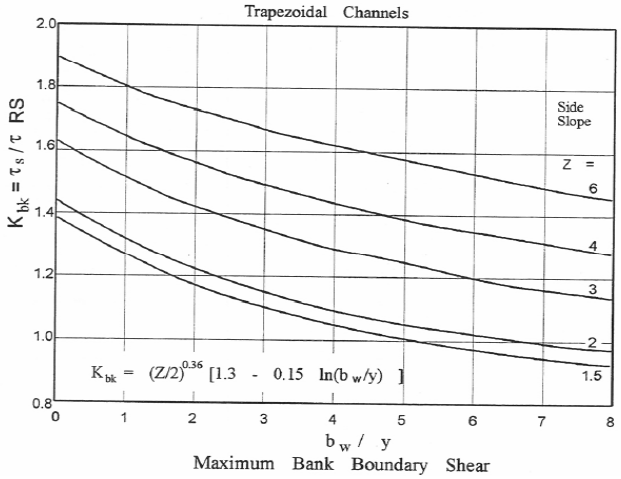
τ_{cb} = critical side Shear Stress of particles on Channel Bed (kg/m^2)

Terrafix Flexamat has been specified to line the chanel bed and slopes. The following information has been taken from the Terrafix Flexamat specification sheet.

Unvegetated Maximum Permissible Shear Stress =	1149 Pa
Maximum Flow Velocity Unvegetated =	5.8 m/s
Unvegetated Mannings 'N' =	0.055
τ_{cb} = 1149.00 N/m^2	1Pa = 1N/m^2

Note:
Terrafix Flexamat wil be used as a channel lining for the Emergency Overflow Weir Channel. According to the product data sheet the terrafix fleximat has an unvegetated maximum shear stress of 1149 N/m^2 and a limiting velocity of 5.8m/s. The shear stresses acting on the channel bed and banks and the maximum velocity in the channel are all within maximum limits. Therefore this product is suitable to line the SWMF emergency overflow weir channel.

Design Chart 2.12: Coefficients of Boundary Shear on the Side Slope



Design Chart 2.16: Permissible Shear for Lining Materials

Vegetative			Permissible Unit Shear Stress (kg / m^2)	
Class A			18	
Class B			10	
Class C			4.9	
Class D			2.9	
Class E			1.7	
Gravel Riprap	1"	25 mm	1.6	Estimates only. Permissible shear stress is dependent on several factors including flow depth, velocity, bank side slope, etc.
	2"	50 mm	3.2	
Rock Riprap	6"	150 mm	9.8	
	12"	300 mm	20	

Note: Class A, B, C, D and E shown on Design Chart 2.23

SUMMARY		
SWMF10 Emergency Overflow Channel		
	Channel Boundary Shear Stress (N/m^2)	Channel Boundary Shear Stress (N/m^2)
Channel Bed	304.02	1149.00
Channel Banks	175.84	1149.00

636040 Prince of Wales Road
OTTHYMO Peak Flow Models - Summary of Results

CLIENT: DELTINI Commercial Developments Inc.

PROJECT: 636040 Prince of Wales Road

FILE: FRE-17110 (50)

DATE: July 2024

DESIGN: MG/VS

CHECKED: MF

Pre Development Area: 43.640 ha
Post Development Area: 43.640 ha

PRE DEVELOPMENT									
CHI		RUN	NHYD	DT (HR)	AREA (HA)	PEAK FLOW (m^3/s)	TP (HR)	R.V. (MM)	DWF
Chicago 4 hour									
25mm	Pre-Dev-PF WQE	Pre-Dev-PF WQE	6	0.033	43.64	0.244	1.5	2.405	0
2-YR	Pre-Dev-PF 2yr 4	Pre-Dev-PF 2yr 4hr CHI	6	0.033	43.64	0.494	1.333	4.692	0
5-YR	Pre-Dev-PF 5yr 4	Pre-Dev-PF 5yr 4hr CHI	6	0.033	43.64	0.697	1.333	8.126	0
10-YR	Pre-Dev-PF 10yr	Pre-Dev-PF 10yr 4hr CHI	6	0.033	43.64	0.843	1.333	10.813	0
25-YR	Pre-Dev-PF 25yr	Pre-Dev-PF 25yr 4hr CHI	6	0.033	43.64	1.067	1.367	14.658	0
50-YR	Pre-Dev-PF 50yr	Pre-Dev-PF 50yr 4hr CHI	6	0.033	43.64	1.247	1.367	17.735	0
100-YR	Pre-Dev-PF 100y	Pre-Dev-PF 100yr 4hr CHI	6	0.033	43.64	1.424	1.367	21.131	0

POST DEVELOPMENT								
CHI	RUN	NHYD	DT (HR)	AREA (HA)	PEAK FLOW (m^3/s)	TP (HR)	R.V. (MM)	DWF
25mm	Post-Dev-PF WQE	19	0.033	43.64	0.026	4	7.184	0
2-YR	Post-Dev-PF 2yr 4hr CHI	19	0.033	43.64	0.038	4.833	11.263	0
5-YR	Post-Dev-PF 5yr 4hr CHI	19	0.033	43.64	0.147	4	17.204	0
10-YR	Post-Dev-PF 10yr 4hr CHI	19	0.033	43.64	0.188	4	21.45	0
25-YR	Post-Dev-PF 25yr 4hr CHI	19	0.033	43.64	0.315	4	27.254	0
50-YR	Post-Dev-PF 50yr 4hr CHI	19	0.033	43.64	0.515	3.533	31.787	0
100-YR	Post-Dev-PF 100yr 4hr CHI	19	0.033	43.64	0.694	3.133	36.641	0

Post Matches Pre?	Exceedance	Pre Runoff Volume	Post Runoff Volume	Post to Pre Volume
GOOD	-0.218	1049.5	3135.1	2085.6
GOOD	-0.456	2047.6	4915.2	2867.6
GOOD	-0.550	3546.2	7507.8	3961.6
GOOD	-0.655	4718.8	9360.8	4642.0
GOOD	-0.752	6396.8	11893.6	5496.9
GOOD	-0.732	7739.6	13871.8	6132.3
GOOD	-0.730	9221.6	15990.1	6768.6

PRE DEVELOPMENT									
CHI		RUN	NHYD	DT (HR)	AREA (HA)	PEAK FLOW (m^3/s)	TP (HR)	R.V. (MM)	DWF
SCS 24 hour									
2-YR	Pre-Dev-PF 2yr 2	Pre-Dev-PF 2yr 24hr SCS	6	0.033	43.64	0.681	12.1	12.686	0
5-YR	Pre-Dev-PF 5yr 2	Pre-Dev-PF 5yr 24hr SCS	6	0.033	43.64	1.146	12.1	21.472	0
10-YR	Pre-Dev-PF 10yr	Pre-Dev-PF 10yr 24hr SCS	6	0.033	43.64	1.496	12.33	27.738	0
25-YR	Pre-Dev-PF 25yr	Pre-Dev-PF 25yr 24hr SCS	6	0.033	43.64	2.057	12.33	37.34	0
50-YR	Pre-Dev-PF 50yr	Pre-Dev-PF 50yr 24hr SCS	6	0.033	43.64	2.469	12.33	44.707	0
100-YR	Pre-Dev-PF 100y	Pre-Dev-PF 100yr 24hr SCS	6	0.033	43.64	2.921	12.33	52.441	0
TIMMINS	Pre-Dev-PF Timm	Pre-Dev-PF Timmins	6	0.033	43.64	2.658	7.033	97.929	0

POST DEVELOPMENT								
CHI	RUN	NHYD	DT (HR)	AREA (HA)	PEAK FLOW (m^3/s)	TP (HR)	R.V. (MM)	DWF
2-YR	Post-Dev-PF 2yr 24hr SCS	19	0.033	43.64	0.153	14.63	22.995	0
5-YR	Post-Dev-PF 5yr 24hr SCS	19	0.033	43.64	0.346	13.83	35.421	0
10-YR	Post-Dev-PF 10yr 24hr SCS	19	0.033	43.64	0.678	13.23	43.94	0
25-YR	Post-Dev-PF 25yr 24hr SCS	19	0.033	43.64	1.033	13.07	56.466	0
50-YR	Post-Dev-PF 50yr 24hr SCS	19	0.033	43.64	1.245	13	65.76	0
100-YR	Post-Dev-PF 100yr 24hr SCS	19	0.033	43.64	1.441	12.97	75.296	0
TIMMINS	Post-Dev-PF Timmins	19	0.033	43.64	2.331	7.667	129.947	0

Post Matches Pre?	Exceedance	Pre Runoff Volume	Post Runoff Volume	Post to Pre Volume
GOOD	-0.528	5536.2	10035.0	4498.8
GOOD	-0.800	9370.4	15457.7	6087.3
GOOD	-0.818	12104.9	19175.4	7070.6
GOOD	-1.024	16295.2	24641.8	8346.6
GOOD	-1.224	19510.1	28697.7	9187.5
GOOD	-1.480	22885.3	32859.2	9973.9
GOOD	-0.327	42736.2	56708.9	13972.7

636040 Prince of Wales Road
OTTHYMO LID Models - Performance Summary

CLIENT: DELTINI Commercial Developments Inc.

DATE: July 2024

PROJECT: 636040 Prince of Wales Road

DESIGN: MG/VS

FILE: FRE-17110 (50)

CHECKED: MF

Pre-Development Continuous Event Performance

Names of Contributing Areas	Contributing Area (ha)	Total Runoff Contributing (mm)	Total Runoff Volume (cu.m)	Total Outflow (mm)	Total Outflow (m^3)
101	26.93	266	71633.8	266	71633.8
102	1.74	319	5550.6	319	5550.6
TOTALS:	**28.67**		**77184.4**		**77184.4**

Post-Development 25mm Event Performance

LID Name	Subcatchment LID OTTHYMO ID#	Names of Contributing Areas	Contributing Area (ha)	Total Runoff Contributing (mm)	Total Runoff Volume (cu.m)	LID Infiltration Loss (mm)	Infiltration Volume (cu.m)	Total Outflow (mm)	% of WQE Runoff Captured
No LID	*No LID*	201	4.44	11.15	495.06	0.00	0.0	11.15	0.0%
No LID	*No LID*	202	11.09	11.26	1248.73	0.00	0.0	11.26	0.0%
LID-1	203	203	5.17	12.21	631.26	1.68	86.9	10.53	13.8%
LID-2	204	203 & 204	6.44	10.69	688.42	1.19	76.6	9.50	11.1%
LID-3	205	203, 204 & 205	7.69	9.78	752.30	1.00	77.1	8.78	10.3%
LID-4	206	203, 204, 205 & 206	8.68	9.05	785.37	0.88	76.2	8.17	9.7%
No LID	*No LID*	207	1.35	11.60	156.60	0.00	0.0	11.60	0.0%
No LID	*No LID*	208	2.3	3.26	74.98	0.00	0.0	3.26	0.0%
No LID	*No LID*	209	0.81	1.98	16.01	0.00	0.0	1.98	0.0%
		TOTALS:	**28.67**		**2776.76**		**316.8**		**11.4%**

PERFORMANCE: **1.11 mm**

Post Development Continuous Event Performance

LID Name	Subcatchment LID OTTHYMO ID#	Names of Contributing Areas	Contributing Area (ha)	Total Runoff Contributing (mm)	Total Runoff Volume (cu.m)	LID Infiltration Loss (mm)	Infiltration Volume (cu.m)	Total Outflow (mm)	Total Outflow (m^3)	% of Annual Runoff
No LID	*No LID*	201	4.44	590	26196	0	0	590	26196	0.0%
No LID	*No LID*	202	11.09	594	65875	0	0	594	65875	0.0%
LID-1	203	203	5.17	626	32347	171	8865	454	23482	27.4%
LID-2	204	203 & 204	6.44	483	31086	30	1901	453	29109	6.1%
LID-3	205	203, 204 & 205	7.69	475	36540	25	1899	450	34564	5.2%
LID-4	206	203, 204, 205 & 206	8.68	466	40408	22	1878	444	38454	4.6%
No LID	*No LID*	207	1.35	569	7682	0	0	569	7682	0.0%
No LID	*No LID*	208	2.3	317	7291	0	0	317	7291	0.0%
No LID	*No LID*	209	0.81	274	2219	0	0	274	2219	0.0%
		TOTALS:	**28.67**		**149671**		**14543**		**147717**	**9.7%**

A new Version 1.2.1 of the LID TTT has been updated with the following revised default Land Cover Event Mean Concentrations (EMCs), to sync better with local and regional data associated with these various land cover options and associated TSS and TP loadings generated from the tool.

The LID TTT provides the user with default land cover event mean concentrations (EMCs), along with an 'Other' land use option that provides flexibility for either additional land cover options, modifications to the land cover EMC defaults, and/or mixed land-use EMCs.

Land Cover EMCs

Land Cover	TSS (mg/L)	TP (mg/L)
Paved Surface [1.]	90	0.23
Roof [2.]	7	0.09
Landscaped Area [3.]	100	0.32
Row Crop [4.]	100	0.23
Open Space/Parkland [4.]	27	0.20
Forest [4.]	55	0.23
Wetland [4.]	13	0.81

Data sources:

1. STEP/TRCA and CVC water quality data from various public road and private parking lot sites in the Greater Toronto Area. A conservative value for asphalt would utilize the average of the 75th percentile values. These concentrations for TP and TSS are 0.23 and 90 mg/L, respectively, and are consistent with other northern US studies cited. Recommended for use with parking lots and/or arterial roadways.

2. STEP water quality data from four local roof runoff studies. Utilizing the 75th percentile values, conservative TP and TSS values for roof runoff in the LID TTT would be 0.09 and 7 mg/L respectively.

3. The landscaped area data are from experimental soil plots designed to evaluate feasible alternatives to standard topsoil management practice in new residential developments. As a conservative value, we recommend using the 75th percentile values for TP from a compost amended plot with the addition of 15% for potential synthetic fertilizer applications by property owners or landscape professionals. The TSS EMC default for this land cover has been assigned based on a general correlation only.

4. International Stormwater BMP Database (2018).

STEP anticipates providing additional land cover EMC recommendations and/or defaults by/before the next Version 2.0 release.

636040 Prince of Wales Road
Water Quality Calculations - Mass Balance Approach (Annual)

CLIENT: DELTINI Commercial Developments Inc. **DATE:** July 2024

PROJECT: 636040 Prince of Wales Road **DESIGN:** MG/VS

FILE: FRE-17110 (50) **CHECKED:** MF

Pre-Dev TP Quality Treatment Train Calculations

Sediment Bulk Density = **1600 kg/m³**

Sediment Wet Density = **1230 kg/m³**

Legend: *Catchment*

T.T.	Cum. Area (ha)
TP Out	mg / L
Flow Out	m3
Mass Out	kg

101

No Treatment	26.93
0.20	mg / L
71633.8	m3 OUT
14.5	kg OUT

Weighted EMC	*0.20*	*mg/L*		
Open Space Area	*26.2567*	*ha*		
Rooftop Area	*0.0437*	*ha*	*Wetland Area*	0.1172 *ha*
Paved Area	*0.0842*	*ha*	*Forest Area*	0.4141 *ha*
EMC Open Space	*0.20*	*mg/L*	*EMC Wetland*	*0.81 mg/L*
EMC Rooftop	*0.09*	*mg/L*	*EMC Forest*	*0.23 mg/L*
EMC Paved	*0.23*	*mg/L*		

102

No Treatment	1.74
0.18	mg / L
5550.6	m3 OUT
1.0	kg OUT

Weighted EMC	*0.18*	*mg/L*		
Open Space Area	*1.3334*	*ha*		
Rooftop Area	*0.2769*	*ha*		
Paved Area	*0.1312*	*ha*		
EMC Open Space	*0.20*	*mg/L*		
EMC Rooftop	*0.09*	*mg/L*		
EMC Paved	*0.23*	*mg/L*		

Outfall

No Treatment	28.67
0.20	mg / L
77184.4	m3 OUT
15.57	kg OUT

Annual Mass In: 15.57 kg

636040 Prince of Wales Road
Water Quality Calculations - Mass Balance Approach (Annual)

CLIENT: DELTINI Commercial Developments Inc. **DATE:** July 2024

PROJECT: 636040 Prince of Wales Road **DESIGN:** MG/VS

FILE: FRE-17110 (50) **CHECKED:** MF

Post-Dev TP Quality Treatment Train Calculations

Sediment Bulk Density = 1600 kg/m^3

Sediment Wet Density = 1230 kg/m^3

Legend: *Catchment*

T.T.		Cum. Area (ha)
TP Out	mg / L	**% Rem.**
Flow Out	m3	
Mass Out	kg	
Mass Ret.	kg	
Vol. Ret.	m3	

201

No Treatment	4.44
0.21 mg / L	**0%**
26196.0 m3 OUT	
5.5 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.21*	*mg/L*
Landscaped Area	*1.3741*	*ha*
Rooftop Area	*1.5287*	*ha*
Paved Area	*1.5357*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

202

No Treatment	11.09
0.21 mg / L	**0%**
65874.6 m3 OUT	
13.7 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.21*	*mg/L*
Landscaped Area	*3.3427*	*ha*
Rooftop Area	*3.8877*	*ha*
Paved Area	*3.8615*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

*203

No Treatment	5.17
0.20 mg / L	**0%**
32347.0 m3 OUT	
6.5 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.20*	*mg/L*
Landscaped Area	*1.3061*	*ha*
Rooftop Area	*1.9158*	*ha*
Paved Area	*1.9454*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

*204

No Treatment	1.27
0.21 mg / L	**0%**
7607.3 m3 OUT	
1.6 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.21*	*mg/L*
Landscaped Area	*0.3631*	*ha*
Rooftop Area	*0.4590*	*ha*
Paved Area	*0.4439*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

*205

No Treatment	1.25
0.21 mg / L	**0%**
7425.0 m3 OUT	
1.5 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.21*	*mg/L*
Landscaped Area	*0.3689*	*ha*
Rooftop Area	*0.4467*	*ha*
Paved Area	*0.4335*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

*206

No Treatment	0.99
0.21 mg / L	**0%**
5841.0 m3 OUT	
1.2 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.21*	*mg/L*
Landscaped Area	*0.3125*	*ha*
Rooftop Area	*0.3285*	*ha*
Paved Area	*0.3521*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

*207

No Treatment	1.35
0.28 mg / L	**0%**
7681.5 m3 OUT	
2.1 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.28*	*mg/L*
Landscaped Area	*0.7314*	*ha*
Rooftop Area	*0.0000*	*ha*
Paved Area	*0.6196*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

*LID-1

No Treatment*	5.17
0.20 mg / L	**0%**
23482.0 m3 OUT	
4.7 kg OUT	
1.8 kg RET	
0.0 m3 RET	

*LID-2

No Treatment*	6.44
0.20 mg / L	**0%**
29109.0 m3 OUT	
5.9 kg OUT	
0.4 kg RET	
0.0 m3 RET	

*LID-3

No Treatment*	7.69
0.20 mg / L	**0%**
34564.0 m3 OUT	
7.0 kg OUT	
0.4 kg RET	
0.0 m3 RET	

*LID-4

No Treatment*	8.68
0.20 mg / L	**0%**
38454.0 m3 OUT	
7.8 kg OUT	
0.4 kg RET	
0.0 m3 RET	

*Assumed no TSS removal for flows overtoping the rock check dams.

636040 Prince of Wales Road
Water Quality Calculations - Mass Balance Approach (Annual)

CLIENT: DELTINI Commercial Developments Inc. **DATE:** July 2024

PROJECT: 636040 Prince of Wales Road **DESIGN:** MG/VS

FILE: FRE-17110 (50) **CHECKED:** MF

Post-Dev TP Quality Treatment Train Calculations

208

No Treatment	2.30
0.28 mg / L	**0%**
7291.0 m3 OUT	
2.0 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.28*	*mg/L*
Landscaped Area	*1.6186*	*ha*
Rooftop Area	*0.2669*	*ha*
Paved Area	*0.4170*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

209

No Treatment	0.81
0.32 mg / L	**0%**
2219.4 m3 OUT	
0.7 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Weighted EMC	*0.32*	*mg/L*
Landscaped Area	*0.8138*	*ha*
Rooftop Area	*0.0000*	*ha*
Paved Area	*0.0000*	*ha*
EMC Landscape	*0.32*	*mg/L*
EMC Rooftop	*0.09*	*mg/L*
EMC Paved	*0.23*	*mg/L*

SWMF

Wet Pond	27.86
0.08 mg / L	**63%**
145497.1 m3 OUT	
11.6 kg OUT	
19.6 kg RET	
0.0 m3 RET	

Outfall

No Treatment	28.67
0.09 mg / L	**0%**
147716.5 m3 OUT	
12.3 kg OUT	
0.0 kg RET	
0.0 m3 RET	

Annual Mass In:	**34.90 kg**	**Annual Mass Out:**	**12.34 kg**	**Overall TP Annual Removal:**	**64.6%**

636040 Prince of Wales Road
Water Quality Calculations - LID Facility Drawdown Time

CLIENT: DELTINI Commercial Developments Inc.
DATE: July 2024
PROJECT: 636040 Prince of Wales Road
DESIGN: MG/VS
FILE: FRE-17110 (50)
CHECKED: MF

25mm Event Drawdown Time for LID-1

From LID OTTHYMO model Catchment 203		
Native soil infiltration rate:	24.4	mm/hr
Contributing Area:	5.17	ha
Area of facility:	120	m²
Runon from upstream catchments:	12.21	mm
Bypassed runon over check dam:	10.53	mm
Infiltrated storm water:	1.68	mm

Treated 25mm event Runoff Volume 86.9 m³
Infiltration Flow Rate 0.00081 m³/s

Drawdown Time 29.66 hr

Infiltration Flow rate is an addaption of Equation 4.20 from MOE SWM Planning & Design Manual dated March 2003.

Drawdown Time Equation: $T_D = V_{(25mm)}/(Q \times 3600)$

where ; Td is detention time (hours)
V(25mm) is the 25mm event runoff volume (m³)
Q is infiltration flowrate (m³/s)

Runoff Volume Equation: $V_{(25mm)} = RO_{infiltrated} \times A_{catchment} \times 10$

where ; RO is the infiltrated stormwater from the upstream catchments (mm) (refer to LID summary)
ACatchment is area of contributing drainage area (ha)

Infiltration Flow Rate: $Q_i = (P \times A_{LID})/3600000$

where ; P is the Native Soil Infiltration Rate (mm/hr)
ALID is area of the LID facility (m²)

25mm Event Drawdown Time for LID-2

From LID OTTHYMO model Catchment 204 & LID-1		
Native soil infiltration rate:	2.0	mm/hr
Contributing Area:	6.44	ha
Area of facility:	120	m²
Runon from upstream catchments:	10.69	mm
Bypassed runon over check dam:	9.50	mm
Infiltrated storm water:	1.19	mm

25mm event Runoff Volume 76.6 m³
Infiltration Flow Rate 0.000067 m³/s

Drawdown Time 319.25 hr

Infiltration Flow rate is an addaption of Equation 4.20 from MOE SWM Planning & Design Manual dated March 2003.

Drawdown Time Equation: $T_D = V_{(25mm)}/(Q \times 3600)$

where ; Td is detention time (hours)
V(25mm) is the 25mm event runoff volume (m³)
Q is infiltration flowrate (m³/s)

Runoff Volume Equation: $V_{(25mm)} = RO_{infiltrated} \times A_{catchment} \times 10$

where ; RO is the infiltrated stormwater from the upstream catchments (mm) (refer to LID summary)
ACatchment is area of contributing drainage area (ha)

Infiltration Flow Rate: $Q_i = (P \times A_{LID})/3600000$

where ; P is the Native Soil Infiltration Rate (mm/hr)
ALID is area of the LID facility (m²)

25mm Event Drawdown Time for LID-3

From LID OTTHYMO model Catchment 205 & LID-2		
Native soil infiltration rate:	2.0	mm/hr
Contributing Area:	7.69	ha
Area of facility:	120	m²
Runon from upstream catchments:	9.78	mm
Bypassed runon over check dam:	8.78	mm
Infiltrated storm water:	1.00	mm

25mm event Runoff Volume 77.1 m³
Infiltration Flow Rate 0.000067 m³/s

Drawdown Time 321.33 hr

Infiltration Flow rate is an addaption of Equation 4.20 from MOE SWM Planning & Design Manual dated March 2003.

Drawdown Time Equation: $T_D = V_{(25mm)}/(Q \times 3600)$

where ; Td is detention time (hours)
V(25mm) is the 25mm event runoff volume (m³)
Q is infiltration flowrate (m³/s)

Runoff Volume Equation: $V_{(25mm)} = RO_{infiltrated} \times A_{catchment} \times 10$

where ; RO is the infiltrated stormwater from the upstream catchments (mm) (refer to LID summary)
ACatchment is area of contributing drainage area (ha)

Infiltration Flow Rate: $Q_i = (P \times A_{LID})/3600000$

where ; P is the Native Soil Infiltration Rate (mm/hr)
ALID is area of the LID facility (m²)

636040 Prince of Wales Road
Water Quality Calculations - LID Facility Drawdown Time

CLIENT: DELTINI Commercial Developments Inc.

DATE: July 2024

PROJECT: 636040 Prince of Wales Road

DESIGN: MG/VS

FILE: FRE-17110 (50)

CHECKED: MF

25mm Event Drawdown Time for LID-4

From LID OTTHYMO model Catchment 206 & LID-3		
Native soil infiltration rate:	2.0	mm/hr
Contributing Area:	8.68	ha
Area of facility:	120	m²
Runon from upstream catchments:	9.05	mm
Bypassed runon over check dam:	8.17	mm
Infiltrated storm water:	0.88	mm

25mm event Runoff Volume	76.2	m³
Infiltration Flow Rate	0.000067	m³/s
Drawdown Time	317.55	hr

Infiltration Flow rate is an addaption of Equation 4.20 from MOE SWM Planning & Design Manual dated March 2003.

Drawdown Time Equation: $T_D = V_{(25mm)}/(Q \times 3600)$

where ; Td is detention time (hours)
V(25mm) is the 25mm event runoff volume (m³)
Q is infiltration flowrate (m³/s)

Runoff Volume Equation: $V_{(25mm)} = RO_{infiltrated} \times A_{catchment} \times 10$

where ; RO is the infiltrated stormwater from the upstream catchments (mm) (refer to LID summary)
$A_{Catchment}$ is area of contributing drainage area (ha)

Infiltration Flow Rate: $Q_i = (P \times A_{LID})/3600000$

where ; P is the Native Soil Infiltration Rate (mm/hr)
A_{LID} is area of the LID facility (m²)

TABLE A-3
WATER BUDGET - PRE-DEVELOPMENT (Existing) CONDITIONS
636040 Prince of Wales Road West, Township of Mulmur, Ontario

Catchment Designation	Site			
	Environmental Protection (Block 4)	Agricultural Lands	Buildings/Paved Areas	Totals
Area (m^2)	83,100	281,467	5,233	**369,800**
Impervious Ratio	0.00	0.00	1.00	-
Pervious Area (m^2)	83,100	281,467	0	**364,567**
Impervious Area (m^2)	0	0	5,233	**5,233**
Infiltration Factors				
Topography Infiltration Factor	0.15	0.15	0.15	
Soil Infiltration Factor	0.30	0.30	0.30	
Land Cover Infiltration Factor	0.15	0.10	0.10	
MOECC Infiltration Factor	0.60	0.55	0.55	
Actual Infiltration Factor	0.60	0.55	0.55	
Run-Off Coefficient	0.40	0.45	0.45	
Run-Off from Impervious Surfaces*	0.85	0.85	0.85	
Inputs (per Unit Area)				
Precipitation (mm/yr)	996	996	996	
Run-On (mm/yr)	0	0	0	
Other Inputs (mm/yr)	0	0	0	
Outputs (per Unit Area)				
Precipitation Surplus for Pervious Areas (mm/yr)	461	486	486	
Net Surplus (mm/yr)	461	486	486	
Actual Evapotranspiration (mm/yr)	535	509	509	
Evaporation (mm/yr)	149	149	149	
Infiltration (mm/yr)	277	267	267	
Runoff Pervious Areas	184	219	219	
Runoff Impervious Areas	846	846	846	
Inputs (Volumes)				
Precipitation (m^3/yr)	82,751	280,285	5,211	**368,247**
Run-On (m^3/yr)	0	0	0	**0**
Other Inputs (m^3/yr)	0	0	0	**0**
Total Inputs (m^3/yr)	**82,751**	**280,285**	**5,211**	**368,247**
Outputs (Volumes)				
Precipitation Surplus for Pervious Areas (m^3/yr)	38,305	136,878	0	**175,183**
Precipitation Surplus for Impervious Areas (m^3/yr)	0	0	4,429	**4,429**
Net Surplus (m^3/yr)	38,305	136,878	4,429	**179,613**
Actual Evapotranspiration (m^3/yr)	44,446	143,406	0	**187,853**
Evaporation (mm/yr)	0	0	782	**782**
Infiltration (m^3/yr)	22,983	75,283	0	**98,266**
Total Infiltration (m^3/yr)	22,983	75,283	0	**98,266**
Runoff Pervious Areas (m^3/yr)	15,322	61,595	0	**76,917**
Runoff Impervious Areas (m^3/yr)	0	0	4,429	**4,429**
Total Runoff (m^3/yr)	15,322	61,595	4,429	**81,347**
Total Outputs (m^3/yr)	**82,751**	**280,285**	**5,211**	**368,247**
Difference (Inputs - Outputs)	**0**	**0**	**0**	**0**

NOTES:
1) Evaporation from impervious areas are assumed to be 15% of precipitation for flat roofs and paved surfaces, 10% for sloped roofs
2) Impervious Ratio for Agricultural Lands from Preliminary Stormwater Management & Functional Servicing Report
2) Infiltration Factors taken from Table 3.1, SWM Planning & Design Manual (MOE, March 2003)
3) Total outputs is equal to the sum of evapotranspiration, evaporation, total infiltration, and total runoff

TABLE A-4

WATER BUDGET - POST-DEVELOPMENT CONDITIONS WITHOUT MITIGATION

636040 Prince of Wales Road West, Township of Mulmur, Ontario

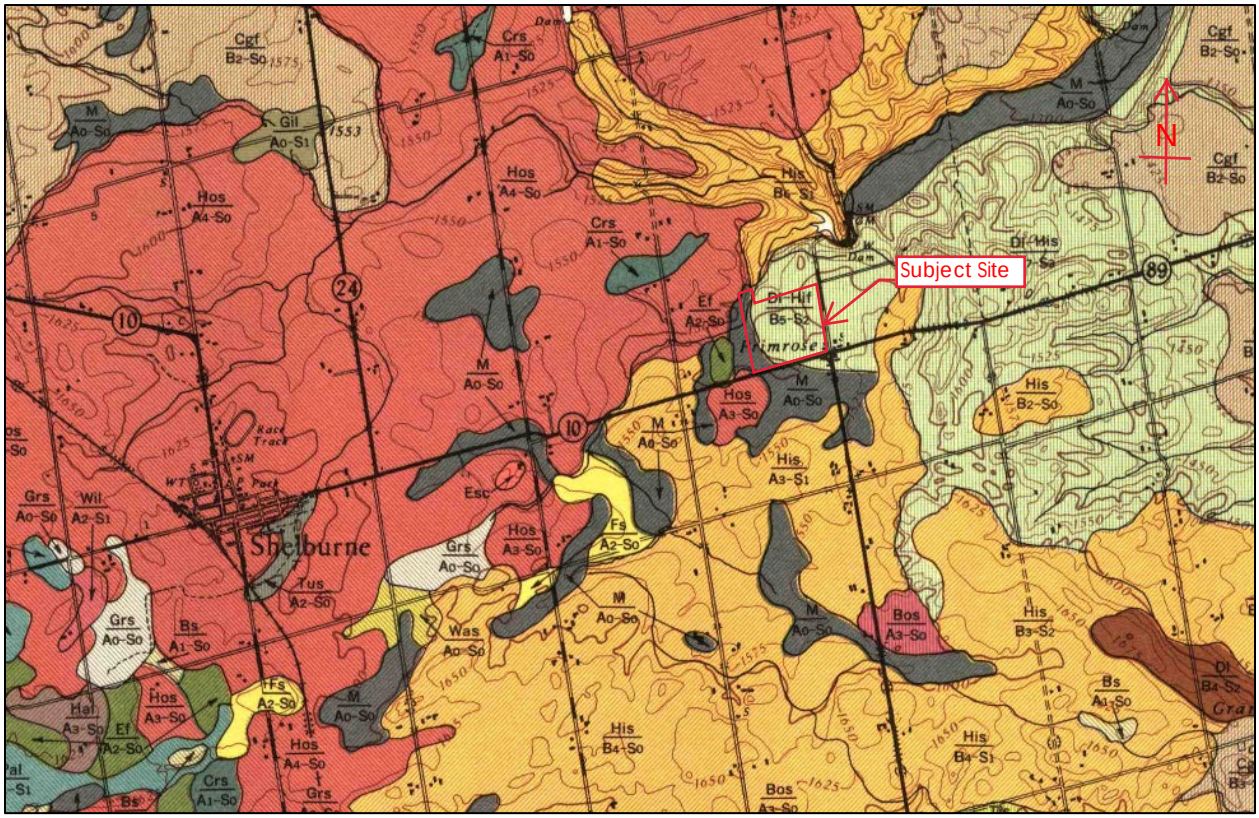
Catchment Designation	Environmental Protection (Block 4)	Industrial Block (Block 1, 2, and 3)	Stormwater Management & Snow Storage (Block 5 & 6)	Roads (Street 'A')	Totals
Area (m^2)	83,100	251,900	21,000	13,800	**369,800**
Impervious Ratio	0.00	0.80	0.20	0.44	-
Pervious Area (m^2)	83,100	50,380	16,800	7,728	**158,008**
Impervious Area (m^2)	0	201,520	4,200	6,072	**211,792**
Infiltration Factors					
Topography Infiltration Factor	0.15	0.15	0.15	0.15	
Soil Infiltration Factor	0.30	0.30	0.30	0.30	
Land Cover Infiltration Factor	0.15	0.10	0.10	0.10	
MOE Infiltration Factor	0.60	0.55	0.55	0.55	
Actual Infiltration Factor	0.60	0.55	0.55	0.55	
Run-Off Coefficient	0.40	0.45	0.45	0.45	
Run-Off from Impervious Surfaces	0.85	0.85	0.85	0.85	
Inputs (per Unit Area)					
Precipitation (mm/yr)	996	996	996	996	
Run-On (mm/yr)	0	0	0	0	
Other Inputs (mm/yr)	0	0	0	0	
Outputs (per Unit Area)					
Precipitation Surplus for Pervious Areas (mm/yr)	461	486	486	486	
Net Surplus (mm/yr)	461	486	486	486	
Actual Evapotranspiration (mm/yr)	535	509	509	509	
Evaporation (mm/yr)	149	149	149	149	
Infiltration (mm/yr)	277	267	267	267	
Runoff Pervious Areas	184	219	219	219	
Runoff Impervious Areas	846	846	846	846	
Inputs (Volumes)					
Precipitation (m^3/yr)	82,751	250,842	20,912	13,742	**368,247**
Run-On (m^3/yr)	0	0	0	0	**0**
Other Inputs (m^3/yr)	0	0	0	0	**0**
Total Inputs (m^3/yr)	**82,751**	**250,842**	**20,912**	**13,742**	**368,247**
Outputs (Volumes)					
Precipitation Surplus for Pervious Areas (m^3/yr)	38,305	24,500	8,170	3,758	**74,733**
Precipitation Surplus for Impervious Areas (m^3/yr)	0	170,573	3,555	5,140	**179,267**
Net Surplus (m^3/yr)	38,305	195,073	11,725	8,898	**254,000**
Actual Evapotranspiration (m^3/yr)	44,446	25,668	8,560	3,937	**82,612**
Evaporation (m^3/yr)	0	30,101	627	907	**31,635**
Infiltration (m^3/yr)	22,983	13,475	4,493	2,067	**43,018**
Total Infiltration (m^3/yr)	22,983	13,475	4,493	2,067	**43,018**
Runoff Pervious Areas (m^3/yr)	15,322	11,025	3,676	1,691	**31,715**
Runoff Impervious Areas (m^3/yr)	0	170,573	3,555	5,140	**179,267**
Total Runoff (m^3/yr)	15,322	181,598	7,231	6,831	**210,982**
Total Outputs (m^3/yr)	**82,751**	**250,842**	**20,912**	**13,742**	**368,247**
Difference (Inputs - Outputs)	**0**	**0**	**0**	**0**	**0**

NOTES:

1) Evaporation from impervious areas are assumed to be 15% of precipitation for flat and paved surfaces, 10% for sloped roofs
2) Impervious Ratio from Preliminary Stormwater Management & Functional Servicing Report
3) Infiltration Factors taken from Table 3.1, SWM Planning & Design Manual (MOE, March 2003)
4) Total outputs is equal to the sum of evapotransporation, evaporation, total infiltration, and total runoff

Soil Survey of Dufferin County

Ontario – Soil Survey Report No. 38



SOIL COMPLEXES		
Dl-Hif	Dumfries-Hillsburgh	7,300
M	Muck	31,000

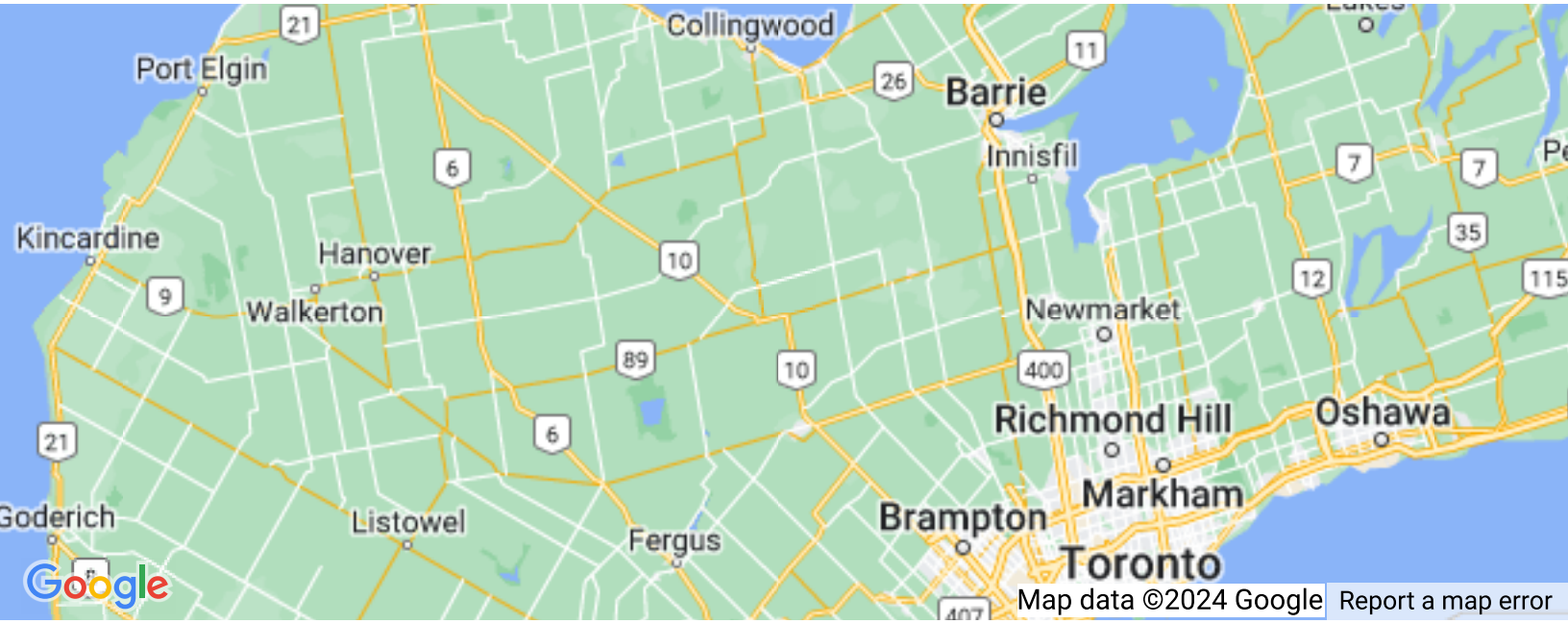
LEGEND

MAP SYMBOL	SOIL SERIES	TYPE	ACREAGE	GREAT GROUP	PARENT MATERIALS	DRAINAGE
Dl	DUMFRIES	loam	2,800	Grey-Brown Podzolic	Stony loam till.	Good
Hif	HILLSBURGH	fine sandy loam	11,000	Grey-Brown Podzolic	Outwash fine sand.	Good

Active coordinate

44° 5' 45" N, 80° 8' 45" W (44.095833,-80.145833)

Retrieved: Wed, 24 Jul 2024 17:58:19 GMT



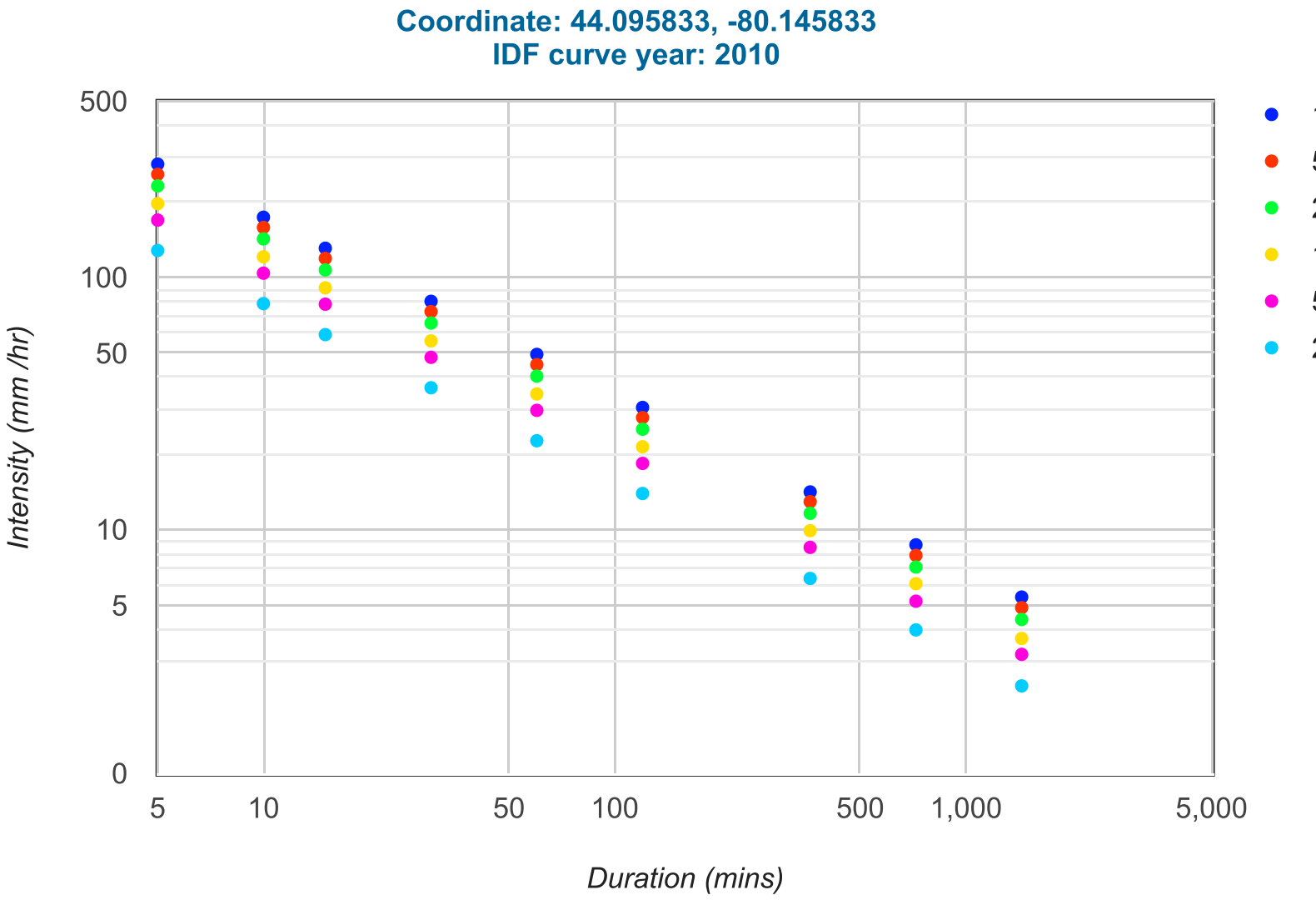
Location summary

These are the locations in the selection.

IDF Curve: 44° 5' 45" N, 80° 8' 45" W (44.095833,-80.145833)

Results

An IDF curve was found.



Coefficient summary

IDF Curve: 44° 5' 45" N, 80° 8' 45" W (44.095833,-80.145833)

Retrieved: Wed, 24 Jul 2024 17:58:19 GMT

Data year: 2010
IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	22.5	29.7	34.5	40.6	45.1	49.5
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr^{-1})

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	127.8	78.7	59.3	36.5	22.5	13.9	6.4	4.0	2.4
5-yr	168.7	103.9	78.3	48.2	29.7	18.3	8.5	5.2	3.2
10-yr	196.0	120.7	90.9	56.0	34.5	21.3	9.9	6.1	3.7
25-yr	230.6	142.1	107.0	65.9	40.6	25.0	11.6	7.1	4.4
50-yr	256.2	157.8	118.9	73.2	45.1	27.8	12.9	7.9	4.9
100-yr	281.2	173.2	130.5	80.4	49.5	30.5	14.1	8.7	5.4

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.6	13.1	14.8	18.3	22.5	27.7	38.6	47.5	58.6
5-yr	14.1	17.3	19.6	24.1	29.7	36.6	50.9	62.7	77.3
10-yr	16.3	20.1	22.7	28.0	34.5	42.5	59.2	72.9	89.8
25-yr	19.2	23.7	26.7	33.0	40.6	50.0	69.6	85.8	105.7
50-yr	21.3	26.3	29.7	36.6	45.1	55.6	77.3	95.3	117.4
100-yr	23.4	28.9	32.6	40.2	49.5	61.0	84.9	104.6	128.8

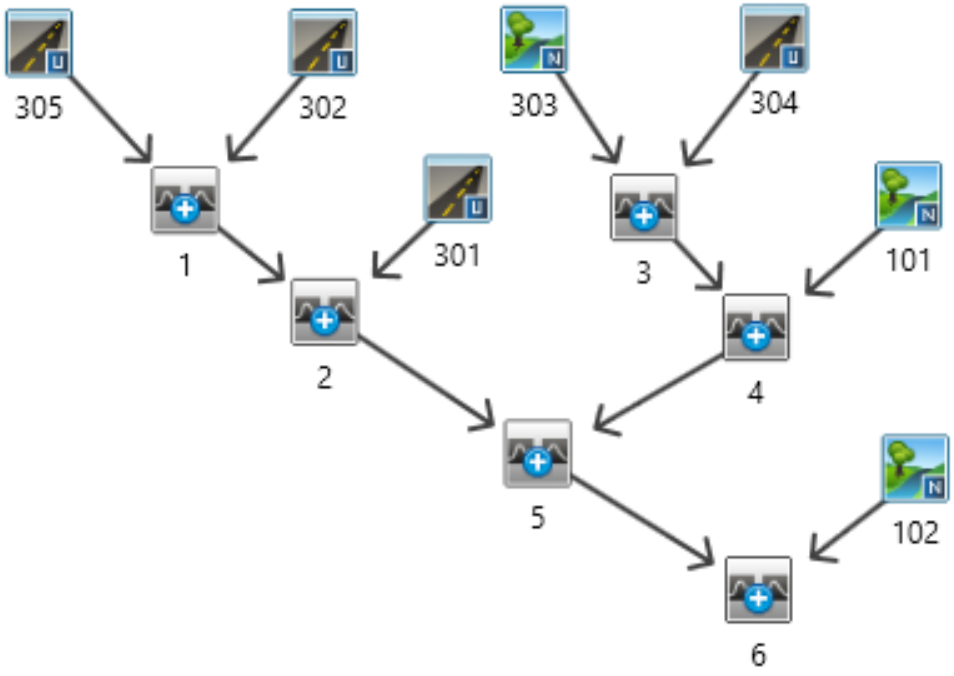
Terms of Use

Appendix C

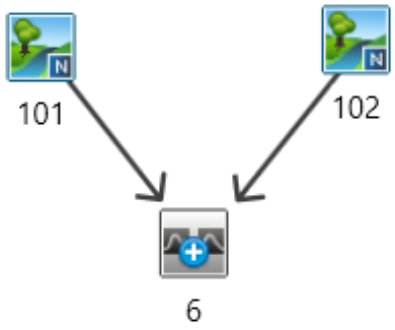
OTTHYMO Schematic & Model Outputs

- OTTHYMO Model Schematics
    - Pre-Dev-PF
    - Pre-Dev-LID
    - Post-Dev-PF
    - Post-Dev-LID
- OTTHYMO Model Input Parameters
    - Catchment Specific Input Parameters
- OTTHYMO Detailed Status Reports
    - Pre-Dev-PF – 100yr 24hr SCS Status Report
    - Post-Dev-PF – 100yr 24hr SCS Status Report
    - Post-Dev-LID – 25mm Water Quality Event Status Report
- OTTHYMO SWMF Detailed Output Post-Dev-PF Single Event Durations
- Digital Modeling Files
    - Ruskview Rain Station 2003 – Climatology Data
    - OTTHYMO Continuous Model Simulation
    - OTTHYMO Single Event Model Simulation

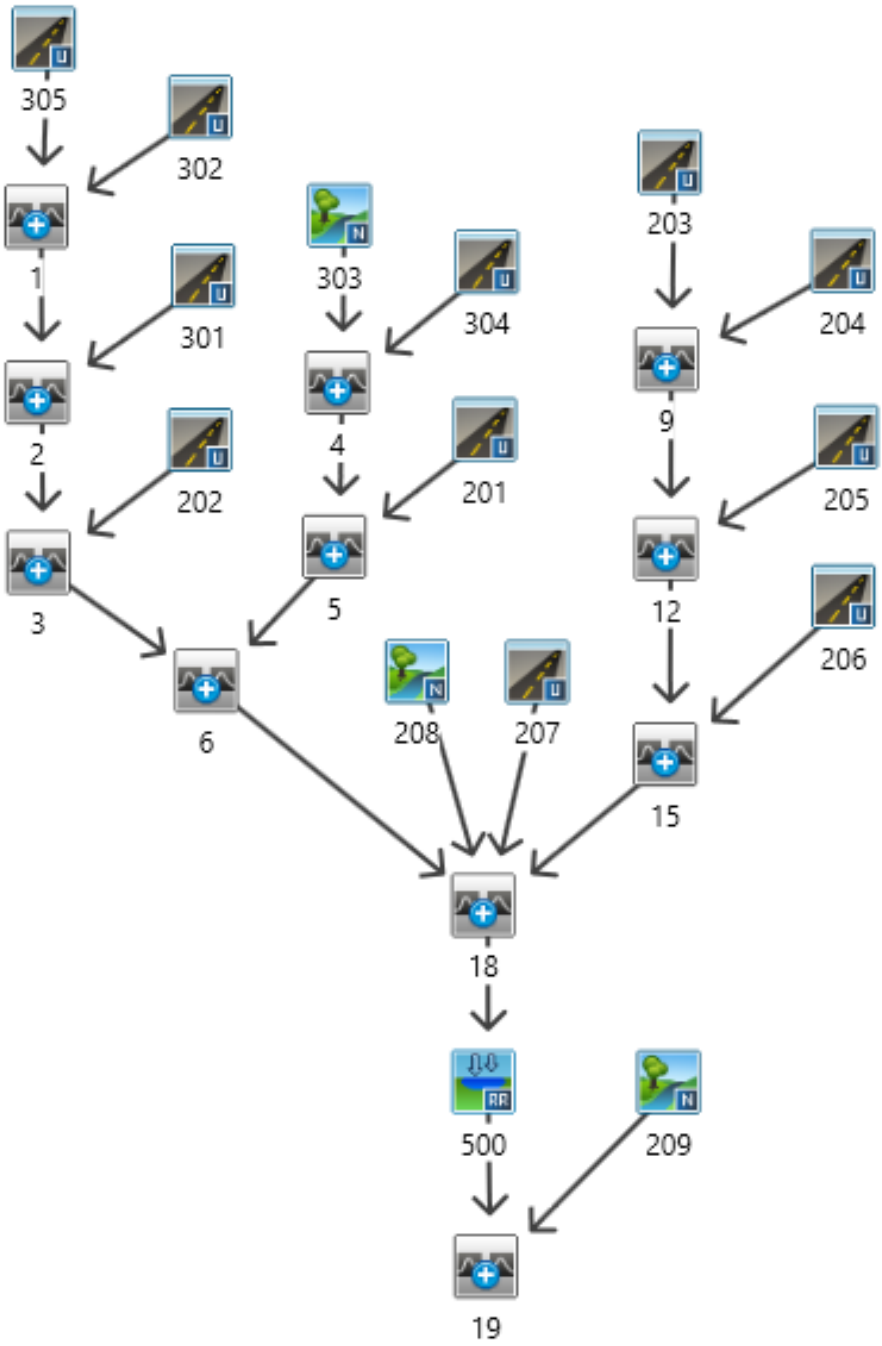
Pre-Development Peak Flow Model Schematic



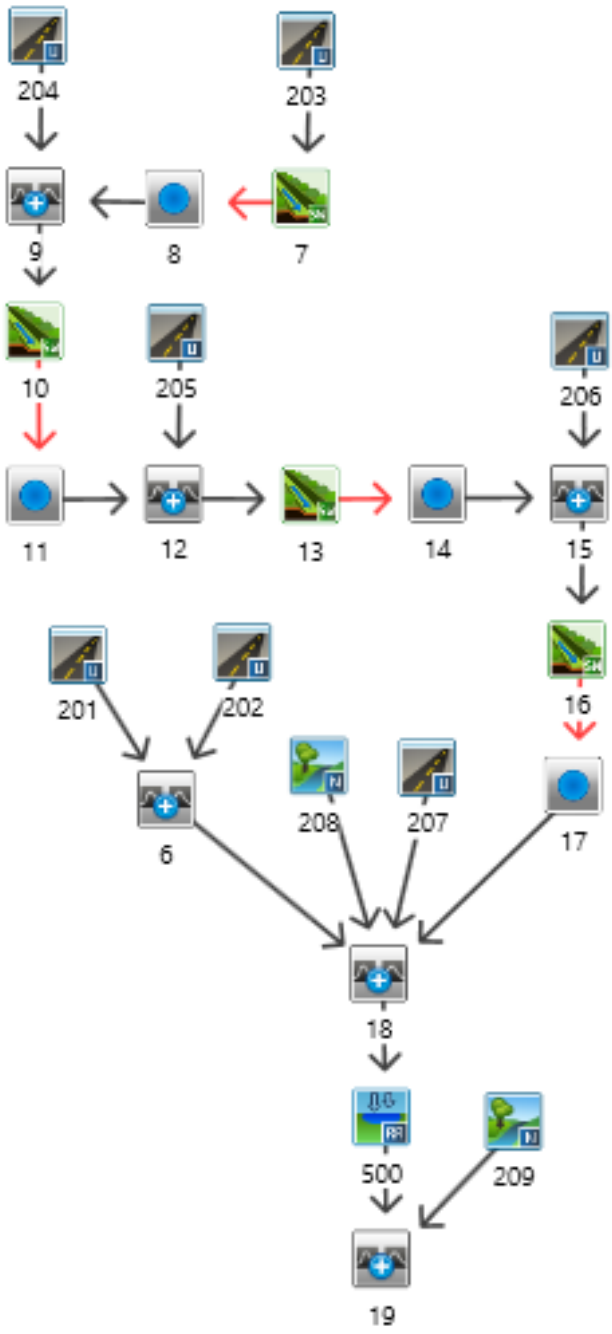
Pre-Development LID Model Schematic



Post-Development Peak Flow Model Schematic



Post-Development LID Model Schematic



OTTHYMO Pre-Development Model Inputs
Catchment Area 101

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	101		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.117	50.0	0.05
Woods(ha)/CN	0.414	46.0	0.08
Pasture/Lawn Area(ha)/CN	26.257	59.0	0.10
Cultivated(ha)/CN	0.016	68.0	0.22
Impervious Area(ha)/CN	0.128	100.0	0.95

Calculated:

Area	26.932
Average CN	59
Average Pervious CN	59
Average Runoff 'C'	0.10

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	8	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	8.04	mm
Average Pervious IA	8.07	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	350	m

Calculated:

Catchment Ave. Slope	3.30	%
Imperviousness	0%	
Directly Connected Imperviousness	0%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.10	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.11	
50YR Rational 'C'	0.12	
100YR Rational 'C'	0.13	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	40.98	min
Time of Concentration	0.68	hr
Time to Peak	0.46	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	11.30	min
Time of Concentration	0.19	hr
Time to Peak	0.13	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.68**	**hr**
Time to Peak	**0.46**	**hr**

Catchment Area Summary (101)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.1172	50	5.86	0.05	0.0059
Woods "AB"	0.4141	46	19.05	0.08	0.0331
Pasture/Lawn "AB"	26.2567	59	1549.15	0.10	2.6257
Cultivated "AB"	0.0158	68	1.07	0.22	0.0035
Impervious "AB" (Connected)	0.0842	100	8.42	0.95	0.0800
Impervious "AB" (Dis-Connected)	0.0437	100	4.37	0.95	0.0415
Total Area "AB"	26.93				
Weighted CN "AB"			58.96		0.1036
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.28	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.40	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	26.93	Weighted CN	58.96	Weighted "C"	0.1036

Mannings Woods = 0.40
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Pre-Development Model Inputs
Catchment Area 102

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	102		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	1.333	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.408	100.0	0.95

Calculated:

Area	1.742
Average CN	69
Average Pervious CN	59
Average Runoff 'C'	0.30

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	8	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	6.59	mm
Average Pervious IA	8.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	130	m

Calculated:

Catchment Ave. Slope	3.5	%
Imperviousness	23%	
Directly Connected Imperviousness	16%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.30	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.33	
50YR Rational 'C'	0.36	
100YR Rational 'C'	0.37	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	19.69	min
Time of Concentration	0.33	hr
Time to Peak	0.22	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	5.46	min
Time of Concentration	0.09	hr
Time to Peak	0.06	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.33**	**hr**
Time to Peak	**0.22**	**hr**

Catchment Area Summary (102)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	1.3334	59	78.67	0.10	0.1333
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.2769	100	27.69	0.95	0.2631
Impervious "AB" (Dis-Connected)	0.1312	100	13.12	0.95	0.1246
Total Area "AB"	1.74				
Weighted CN "AB"			68.61		0.2992
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.28	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.40	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	1.74	Weighted CN	68.61	Weighted "C"	0.2992

Mannings Woods = 0.40
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Pre & Post-Development Model Inputs
Catchment Area 301

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	301		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	2.289	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.981	100.0	0.95

Calculated:

Area	3.270
Average CN	71
Average Pervious CN	59
Average Runoff 'C'	0.36

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	4.10	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	120	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	30%	
Directly Connected Imperviousness	30%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.36	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.39	
50YR Rational 'C'	0.43	
100YR Rational 'C'	0.44	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	21.17	min
Time of Concentration	0.35	hr
Time to Peak	0.24	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	5.29	min
Time of Concentration	0.09	hr
Time to Peak	0.06	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.35**	**hr**
Time to Peak	**0.24**	**hr**

Catchment Area Summary (301)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.000	50	0.00	0.05	0.0000
Woods "AB"	0.000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	2.289	59	135.05	0.10	0.2289
Cultivated "AB"	0.000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.981	100	98.10	0.95	0.9320
Impervious "AB" (Dis-Connected)	0.000	100	0.00	0.95	0.0000
Total Area "AB"	3.27				
Weighted CN "AB"			71.30		0.3550
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.28	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.40	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	3.27	Weighted CN	71.30	Weighted "C"	0.3550

Mannings Woods = 0.40
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Pre & Post-Development Model Inputs
Catchment Area 302

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	302		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.945	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.404	100.0	0.95

Calculated:

Area	1.349
Average CN	71
Average Pervious CN	59
Average Runoff 'C'	0.35

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	4.10	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	40	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	30%	
Directly Connected Imperviousness	20%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.35	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.39	
50YR Rational 'C'	0.43	
100YR Rational 'C'	0.44	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	12.23	min
Time of Concentration	0.20	hr
Time to Peak	0.14	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	1.93	min
Time of Concentration	0.03	hr
Time to Peak	0.02	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.20**	**hr**
Time to Peak	**0.14**	**hr**

Catchment Area Summary (302)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.9447	59	55.74	0.10	0.0945
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.2695	100	26.95	0.95	0.2560
Impervious "AB" (Dis-Connected)	0.1345	100	13.45	0.95	0.1278
Total Area "AB"	1.35				
Weighted CN "AB"			71.28		0.3546
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.28	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.40	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	1.35	Weighted CN	71.28	Weighted "C"	0.3546

Mannings Woods = 0.40
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Pre & Post-Development Model Inputs
Catchment Area 303

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	303		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	2.888	50.0	0.05
Woods(ha)/CN	1.324	46.0	0.08
Pasture/Lawn Area(ha)/CN	4.948	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A

Calculated:

Area	9.160
Average CN	54.3
Average Pervious CN	54.3
Average Runoff 'C'	0.08

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	8.80	mm
Average Pervious IA	8.80	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	60	m

Calculated:

Catchment Ave. Slope	2.50	%
Imperviousness	0%	
Directly Connected Imperviousness	0%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.08	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.09	
50YR Rational 'C'	0.10	
100YR Rational 'C'	0.10	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	19.01	min
Time of Concentration	0.32	hr
Time to Peak	0.21	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	2.28	min
Time of Concentration	0.04	hr
Time to Peak	0.03	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.32**	**hr**
Time to Peak	**0.21**	**hr**

Catchment Area Summary (303)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	2.8880	50	144.40	0.05	0.1444
Woods "AB"	1.3240	46	60.90	0.08	0.1059
Pasture/Lawn "AB"	4.9480	59	291.93	0.10	0.4948
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.0000	100	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected)	0.0000	100	0.00	0.95	0.0000
Total Area "AB"	9.16				
Weighted CN "AB"			54.80		0.0813
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.28	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.40	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	9.16	Weighted CN	54.80	Weighted "C"	0.0813

Mannings Woods = 0.40
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.23

OTTHYMO Pre & Post-Development Model Inputs
Catchment Area 304

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	304		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.523	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.437	100.0	0.95

Calculated:

Area	0.960
Average CN	78
Average Pervious CN	59
Average Runoff 'C'	0.49

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	3.63	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	200	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	46%	
Directly Connected Imperviousness	46%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.49	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.54	
50YR Rational 'C'	0.58	
100YR Rational 'C'	0.61	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	22.49	min
Time of Concentration	0.37	hr
Time to Peak	0.25	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	9.96	min
Time of Concentration	0.17	hr
Time to Peak	0.11	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.17**	**hr**
Time to Peak	**0.11**	**hr**

Catchment Area Summary (304)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.5231	59	30.86	0.10	0.0523
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.4369	100	43.69	0.95	0.4151
Impervious "AB" (Dis-Connected)	0.0000	100	0.00	0.95	0.0000
Total Area "AB"	0.96				
Weighted CN "AB"			77.66		0.4868
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.28	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.40	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	0.96	Weighted CN	77.66	Weighted "C"	0.4868

Mannings Woods = 0.40
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Pre & Post-Development Model Inputs
Catchment Area 305

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	305		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.081	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.152	100.0	0.95

Calculated:

Area	0.233
Average CN	86
Average Pervious CN	59
Average Runoff 'C'	0.65

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	3.05	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	45	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	65%	
Directly Connected Imperviousness	65%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.65	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.72	
50YR Rational 'C'	0.78	
100YR Rational 'C'	0.82	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	7.77	min
Time of Concentration	0.13	hr
Time to Peak	0.09	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	2.58	min
Time of Concentration	0.04	hr
Time to Peak	0.03	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.04**	**hr**
Time to Peak	**0.03**	**hr**

Catchment Area Summary (305)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0813	59	4.80	0.10	0.0081
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.1517	100	15.17	0.95	0.1441
Impervious "AB" (Dis-Connected)	0.0000	100	0.00	0.95	0.0000
Total Area "AB"	0.23				
Weighted CN "AB"			85.69		0.6534
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.28	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.40	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	0.23	Weighted CN	85.69	Weighted "C"	0.6534

Mannings Woods = 0.40
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 201

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	201		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	1.374	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	3.064	100.0	0.95

Calculated:

Area	4.439
Average CN	87
Average Pervious CN	59
Average Runoff 'C'	0.69

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	2.93	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	170	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	69%	
Directly Connected Imperviousness	35%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.69	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.76	
50YR Rational 'C'	0.82	
100YR Rational 'C'	0.86	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	13.97	min
Time of Concentration	0.23	hr
Time to Peak	0.16	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	7.27	min
Time of Concentration	0.12	hr
Time to Peak	0.08	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.121**	**hr**
Time to Peak	**0.081**	**hr**

Catchment Area Summary (201)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	1.3741	59	81.07	0.1	0.1374
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	1.5357	100	153.57	0.95	1.4589
Impervious "AB" (Dis-Connected)	1.5287	100	152.87	0.95	1.4523
Total Area "AB"	4.4385				
Weighted CN "AB"			87.31		0.6869
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	4.44	Weighted CN	87.31	Weighted "C"	0.6869

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 202

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	202		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	3.343	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	7.749	100.0	0.95

Calculated:

Area	11.092
Average CN	88
Average Pervious CN	59
Average Runoff 'C'	0.69

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	2.90	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	180	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	70%	
Directly Connected Imperviousness	35%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.69	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.76	
50YR Rational 'C'	0.83	
100YR Rational 'C'	0.87	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	14.13	min
Time of Concentration	0.24	hr
Time to Peak	0.16	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	7.02	min
Time of Concentration	0.12	hr
Time to Peak	0.08	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.117**	**hr**
Time to Peak	**0.078**	**hr**

Catchment Area Summary (202)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.000	50	0.00	0.05	0.0000
Woods "AB"	0.000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	3.343	59	197.22	0.1	0.3343
Cultivated "AB"	0.000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	3.862	100	386.15	0.95	3.6684
Impervious "AB" (Dis-Connected)	3.888	100	388.77	0.95	3.6933
Total Area "AB"	11.0919				
Weighted CN "AB"			87.64		0.6938
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	11.09	Weighted CN	87.64	Weighted "C"	0.6938

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 203

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	203		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	1.306	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	3.861	100.0	0.95

Calculated:

Area	5.1673
Average CN	90
Average Pervious CN	59
Average Runoff 'C'	0.74

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	2.76	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	190	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	75%	
Directly Connected Imperviousness	38%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.74	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.81	
50YR Rational 'C'	0.88	
100YR Rational 'C'	0.92	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	13.04	min
Time of Concentration	0.22	hr
Time to Peak	0.14	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	8.00	min
Time of Concentration	0.13	hr
Time to Peak	0.09	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.133**	**hr**
Time to Peak	**0.089**	**hr**

Catchment Area Summary (203)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	1.3061	59	77.06	0.1	0.1306
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	1.9454	100	194.54	0.95	1.8481
Impervious "AB" (Dis-Connected)	1.9158	100	191.58	0.95	1.8200
Total Area "AB"	5.1673				
Weighted CN "AB"			89.64		0.7352
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	5.17	Weighted CN	89.64	Weighted "C"	0.7352

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 204

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	204		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.363	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.903	100.0	0.95

Calculated:

Area	1.266
Average CN	88
Average Pervious CN	59
Average Runoff 'C'	0.71

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	2.86	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	170	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	71%	
Directly Connected Imperviousness	35%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.71	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.78	
50YR Rational 'C'	0.85	
100YR Rational 'C'	0.88	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	13.32	min
Time of Concentration	0.22	hr
Time to Peak	0.15	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	8.24	min
Time of Concentration	0.14	hr
Time to Peak	0.09	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.137**	**hr**
Time to Peak	**0.092**	**hr**

Catchment Area Summary (204)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.3631	59	21.42	0.1	0.0363
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.4439	100	44.39	0.95	0.4217
Impervious "AB" (Dis-Connected)	0.4590	100	45.90	0.95	0.4361
Total Area "AB"	1.2660				
Weighted CN "AB"			88.24		0.7062
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	1.27	Weighted CN	88.24	Weighted "C"	0.7062

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 205

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	205		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.369	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.880	100.0	0.95

Calculated:

Area	1.249
Average CN	88
Average Pervious CN	59
Average Runoff 'C'	0.70

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	2.89	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	170	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	70%	
Directly Connected Imperviousness	35%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.70	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.77	
50YR Rational 'C'	0.84	
100YR Rational 'C'	0.87	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	13.56	min
Time of Concentration	0.23	hr
Time to Peak	0.15	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	8.25	min
Time of Concentration	0.14	hr
Time to Peak	0.09	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.138**	**hr**
Time to Peak	**0.092**	**hr**

Catchment Area Summary (205)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.3689	59	21.77	0.1	0.0369
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.4335	100	43.35	0.95	0.4118
Impervious "AB" (Dis-Connected)	0.4467	100	44.67	0.95	0.4244
Total Area "AB"	1.2491				
Weighted CN "AB"			87.89		0.698967
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	1.25	Weighted CN	87.89	Weighted "C"	0.698967

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 206

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	206		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.313	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.681	100.0	0.95

Calculated:

Area	0.993
Average CN	87
Average Pervious CN	59
Average Runoff 'C'	0.68

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	2.94	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	170	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	69%	
Directly Connected Imperviousness	35%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.68	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.75	
50YR Rational 'C'	0.82	
100YR Rational 'C'	0.85	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	14.12	min
Time of Concentration	0.24	hr
Time to Peak	0.16	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	8.44	min
Time of Concentration	0.14	hr
Time to Peak	0.09	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.141**	**hr**
Time to Peak	**0.094**	**hr**

Catchment Area Summary (206)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.3125	59	18.44	0.1	0.0313
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.3521	100	35.21	0.95	0.3345
Impervious "AB" (Dis-Connected)	0.3285	100	32.85	0.95	0.3121
Total Area "AB"	0.9931				
Weighted CN "AB"			87.10		0.6825
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	0.9931	Weighted CN	87.10	Weighted "C"	0.6825

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 207

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	207		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.731	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.620	100.0	0.95

Calculated:

Area	1.351
Average CN	78
Average Pervious CN	59
Average Runoff 'C'	0.49

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	3.62	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	450	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	46%	
Directly Connected Imperviousness	46%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.49	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.54	
50YR Rational 'C'	0.59	
100YR Rational 'C'	0.61	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	33.57	min
Time of Concentration	0.56	hr
Time to Peak	0.37	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	21.67	min
Time of Concentration	0.36	hr
Time to Peak	0.24	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.361**	**hr**
Time to Peak	**0.241**	**hr**

Catchment Area Summary (207)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.7314	59	43.15	0.1	0.0731
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.6196	100	61.96	0.95	0.5886
Impervious "AB" (Dis-Connected)	0.0000	100	0.00	0.95	0.0000
Total Area "AB"	1.3510				
Weighted CN "AB"			77.80		0.4898
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	1.35	Weighted CN	77.80	Weighted "C"	0.4898

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 208

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	208		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	1.619	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.684	100.0	0.95

Calculated:

Area	2.303
Average CN	71.2
Average Pervious CN	59
Average Runoff 'C'	0.35

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	4.11	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	40	m

Calculated:

Catchment Ave. Slope	5.00	%
Imperviousness	29.7%	
Directly Connected Imperviousness	18%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.35	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.39	
50YR Rational 'C'	0.42	
100YR Rational 'C'	0.44	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	9.06	min
Time of Concentration	0.15	hr
Time to Peak	0.10	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	1.52	min
Time of Concentration	0.03	hr
Time to Peak	0.02	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.151**	**hr**
Time to Peak	**0.101**	**hr**

Catchment Area Summary (208)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	1.6186	59	95.50	0.10	0.1619
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.4170	100	41.70	0.95	0.3962
Impervious "AB" (Dis-Connected)	0.2669	100	26.69	0.95	0.2536
Total Area "AB"	2.3025				
Weighted CN "AB"			71.18		0.3525
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	2.30	Weighted CN	71.18	Weighted "C"	0.3525

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area 209

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	209		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.814	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A

Calculated:

Area	0.814
Average CN	59
Average Pervious CN	59
Average Runoff 'C'	0.10

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	5.00	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	12	m

Calculated:

Catchment Ave. Slope	33.33	%
Imperviousness	0%	
Directly Connected Imperviousness	0%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.10	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.11	
50YR Rational 'C'	0.12	
100YR Rational 'C'	0.13	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	3.55	min
Time of Concentration	0.06	hr
Time to Peak	0.04	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	0.35	min
Time of Concentration	0.01	hr
Time to Peak	0.00	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.059**	**hr**
Time to Peak	**0.039**	**hr**

Catchment Area Summary (209)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.1	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.8138	59	48.01	0.10	0.0814
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.0000	100	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected)	0.0000	100	0.00	0.95	0.0000
Total Area "AB"	0.8138				
Weighted CN "AB"			59.0		0.10
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	0.81	Weighted CN	59	Weighted "C"	0.10

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.19

OTTHYMO Post-Development Model Inputs
Catchment Area SWMF

Overall contributing area to the SWMF: 301, 302, 303, 304, 305, 201, 202, 203, 204, 205, 206, 207, 208

CLIENT: DELTINI Commercial Developments Inc.
PROJECT: 636040 Prince of Wales Road
FILE: FRE-17110

DATE: July 2024
DESIGN: MG/VS
CHECKED: MF

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	208		
Hydrologic Soil Group	AB		
Soil Texture	Dumfries Loam		
Wetland(ha)/CN	2.888	50.0	0.05
Woods(ha)/CN	1.324	46.0	0.08
Pasture/Lawn Area(ha)/CN	18.204	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	20.416	100.0	0.95

Calculated:

Area	42.831	
Average CN	77.5	
Average Pervious CN	57.1	57.1
Average Runoff 'C'	0.50	

Initial Abstraction Calculator

Input:

Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm

Calculated:

Total Average IA	4.47	mm
Average Pervious IA	6.71	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator

Input:

Catchment Max El.	N/A	m
Catchment Min. El.	N/A	m
Catchment Flow Length	1252	m

Calculated:

Catchment Ave. Slope	0.50	%
Imperviousness	47.7%	
Directly Connected Imperviousness	27%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.50	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.55	
50YR Rational 'C'	0.60	
100YR Rational 'C'	0.63	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	86.83	min
Time of Concentration	1.45	hr
Time to Peak	0.96	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	56.30	min
Time of Concentration	0.94	hr
Time to Peak	0.63	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.938**	**hr**
Time to Peak	**0.626**	**hr**

Catchment Area Summary (SWM)

	Areas	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0	50	0	0.05	0
Woods "A"	0	32	0	0.08	0
Pasture/Lawn "A"	0	49	0	0.10	0
Cultivated "A"	0	62	0	0.22	0
Impervious "A" (Connected)	0	100	0	0.95	0
Impervious "A" (Dis-Connected)	0	100	0	0.95	0
Total Area "A"	0				
Weighted CN "A"			0		0
Wetlands "AB"	2.8880	50	144.40	0.05	0.1444
Woods "AB"	1.3240	46	60.90	0.08	0.1059
Pasture/Lawn "AB"	18.2035	59	1074.01	0.10	1.8204
Cultivated "AB"	0.0000	68	0.00	0.22	0.0000
Impervious "AB" (Connected)	11.4478	100	1144.78	0.95	10.8754
Impervious "AB" (Dis-Connected)	8.9678	100	896.78	0.95	8.5194
Total Area "AB"	42.8311				
Weighted CN "AB"			77.53		0.50
Wetlands "B"	0	50	0	0.05	0
Woods "B"	0	60	0	0.25	0
Pasture/Lawn "B"	0	69	0	0.16	0
Cultivated "B"	0	74	0	0.35	0
Impervious "B" (Connected)	0	100	0	0.95	0
Impervious "B" (Dis-Connected)	0	100	0	0.95	0
Total Area "B"	0				
Weighted CN "B"			0		0
Wetlands "CD"	0	50	0	0.05	0
Woods "CD"	0	76	0	0.35	0
Pasture/Lawn "CD"	0	82	0	0.22	0
Cultivated "CD"	0	84	0	0.55	0
Impervious "CD" (Connected)	0	100	0	0.95	0
Impervious "CD" (Dis-Connected)	0	100	0	0.95	0
Total Area "CD"	0				
Weighted CN "CD"			0		0
Totals:	42.83	Weighted CN	77.53	Weighted "C"	0.5012

Mannings Woods = 0.50
Mannings Pasture/Lawn = 0.19
Average Pervious Mannings= 0.21

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================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.1.2002)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat
  Output              filename:       C:\Users\vsperandim\AppData\Local\Civica\VH5
\4ef9d6d3-9cba-4cfa-be0b-2fce60e5724c\9eb859a4-847b-48ac-b85b-790263be6cbe\s
  Summary          filename:          C:\Users\vsperandim\AppData\Local\Civica\VH5
\4ef9d6d3-9cba-4cfa-be0b-2fce60e5724c\9eb859a4-847b-48ac-b85b-790263be6cbe\s


DATE: 07-24-2023                                TIME: 01:40:33

USER:



COMMENTS: _____________________________________________________________________

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  ************************************************
  ** SIMULATION : Pre-Dev-PF 100yr 24hr SCS     **
  ************************************************


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|    READ STORM    |    Filename: C:\Users\vsperandim\AppD
|                  |              ata\Local\Temp\
|                  |              2040ba0e-38a1-432b-a812-f46d6b3fcab0\1794a611
| Ptotal=129.60 mm |    Comments: 100yr 24hr SCS
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'    hrs   mm/hr |    hrs   mm/hr
                0.08    0.00 |  6.17    2.33 | 12.25   18.66 | 18.33    2.33
                0.17    1.43 |  6.25    2.33 | 12.33   18.66 | 18.42    2.33
                0.25    1.43 |  6.33    2.33 | 12.42   18.66 | 18.50    2.33
                0.33    1.43 |  6.42    2.33 | 12.50   18.66 | 18.58    2.33
                0.42    1.43 |  6.50    2.33 | 12.58   18.66 | 18.67    2.33
                0.50    1.43 |  6.58    2.33 | 12.67    9.59 | 18.75    2.33
                0.58    1.43 |  6.67    2.33 | 12.75    9.59 | 18.83    2.33
                0.67    1.43 |  6.75    2.33 | 12.83    9.59 | 18.92    2.33
                0.75    1.43 |  6.83    2.33 | 12.92    9.59 | 19.00    2.33
                0.83    1.43 |  6.92    2.33 | 13.00    9.59 | 19.08    2.33
                0.92    1.43 |  7.00    2.33 | 13.08    9.59 | 19.17    2.33
                1.00    1.43 |  7.08    2.33 | 13.17    7.00 | 19.25    2.33
```

1.08	1.43	7.17	2.85	13.25	7.00	19.33	2.33
1.17	1.43	7.25	2.85	13.33	7.00	19.42	2.33
1.25	1.43	7.33	2.85	13.42	7.00	19.50	2.33
1.33	1.43	7.42	2.85	13.50	7.00	19.58	2.33
1.42	1.43	7.50	2.85	13.58	7.00	19.67	2.33
1.50	1.43	7.58	2.85	13.67	5.44	19.75	2.33
1.58	1.43	7.67	2.85	13.75	5.44	19.83	2.33
1.67	1.43	7.75	2.85	13.83	5.44	19.92	2.33
1.75	1.43	7.83	2.85	13.92	5.44	20.00	2.33
1.83	1.43	7.92	2.85	14.00	5.44	20.08	2.33
1.92	1.43	8.00	2.85	14.08	5.44	20.17	1.56
2.00	1.43	8.08	2.85	14.17	3.89	20.25	1.56
2.08	1.43	8.17	3.37	14.25	3.89	20.33	1.56
2.17	1.68	8.25	3.37	14.33	3.89	20.42	1.56
2.25	1.68	8.33	3.37	14.42	3.89	20.50	1.56
2.33	1.68	8.42	3.37	14.50	3.89	20.58	1.56
2.42	1.68	8.50	3.37	14.58	3.89	20.67	1.56
2.50	1.68	8.58	3.37	14.67	3.89	20.75	1.56
2.58	1.68	8.67	3.63	14.75	3.89	20.83	1.56
2.67	1.68	8.75	3.63	14.83	3.89	20.92	1.56
2.75	1.68	8.83	3.63	14.92	3.89	21.00	1.56
2.83	1.68	8.92	3.63	15.00	3.89	21.08	1.56
2.92	1.68	9.00	3.63	15.08	3.89	21.17	1.56
3.00	1.68	9.08	3.63	15.17	3.89	21.25	1.56
3.08	1.68	9.17	4.15	15.25	3.89	21.33	1.56
3.17	1.68	9.25	4.15	15.33	3.89	21.42	1.56
3.25	1.68	9.33	4.15	15.42	3.89	21.50	1.56
3.33	1.68	9.42	4.15	15.50	3.89	21.58	1.56
3.42	1.68	9.50	4.15	15.58	3.89	21.67	1.56
3.50	1.68	9.58	4.15	15.67	3.89	21.75	1.56
3.58	1.68	9.67	4.67	15.75	3.89	21.83	1.56
3.67	1.68	9.75	4.67	15.83	3.89	21.92	1.56
3.75	1.68	9.83	4.67	15.92	3.89	22.00	1.56
3.83	1.68	9.92	4.67	16.00	3.89	22.08	1.56
3.92	1.68	10.00	4.67	16.08	3.89	22.17	1.56
4.00	1.68	10.08	4.67	16.17	2.33	22.25	1.56
4.08	1.68	10.17	5.96	16.25	2.33	22.33	1.56
4.17	2.07	10.25	5.96	16.33	2.33	22.42	1.56
4.25	2.07	10.33	5.96	16.42	2.33	22.50	1.56
4.33	2.07	10.42	5.96	16.50	2.33	22.58	1.56
4.42	2.07	10.50	5.96	16.58	2.33	22.67	1.56
4.50	2.07	10.58	5.96	16.67	2.33	22.75	1.56
4.58	2.07	10.67	8.04	16.75	2.33	22.83	1.56
4.67	2.07	10.75	8.04	16.83	2.33	22.92	1.56
4.75	2.07	10.83	8.04	16.92	2.33	23.00	1.56
4.83	2.07	10.92	8.04	17.00	2.33	23.08	1.56
4.92	2.07	11.00	8.04	17.08	2.33	23.17	1.56
5.00	2.07	11.08	8.04	17.17	2.33	23.25	1.56
5.08	2.07	11.17	12.44	17.25	2.33	23.33	1.56
5.17	2.07	11.25	12.44	17.33	2.33	23.42	1.56
5.25	2.07	11.33	12.44	17.42	2.33	23.50	1.56
5.33	2.07	11.42	12.44	17.50	2.33	23.58	1.56
5.42	2.07	11.50	12.44	17.58	2.33	23.67	1.56
5.50	2.07	11.58	12.44	17.67	2.33	23.75	1.56
5.58	2.07	11.67	38.36	17.75	2.33	23.83	1.56
5.67	2.07	11.75	38.36	17.83	2.33	23.92	1.56
5.75	2.07	11.83	38.36	17.92	2.33	24.00	1.56
5.83	2.07	11.92	158.63	18.00	2.33	24.08	1.56
5.92	2.07	12.00	158.63	18.08	2.33		
6.00	2.07	12.08	158.63	18.17	2.33		
6.08	2.07	12.17	18.66	18.25	2.33		

CALIB			
NASHYD (0303)	Area (ha)= 9.16	Curve Number (CN)= 54.8	
ID= 1 DT= 2.0 min	Ia (mm)= 8.80	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.50		

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33

1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56

3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78

	6.033	2.07	12.067	158.63	18.100	2.33	

Unit Hyd Qpeak (cms)= 0.700

PEAK FLOW (cms)= 0.528 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 44.179
TOTAL RAINFALL (mm)= 129.599
RUNOFF COEFFICIENT = 0.341

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

CALIB	
STANDHYD (0304)	Area (ha)= 0.96
ID= 1 DT= 2.0 min	Total Imp(%)= 46.00 Dir. Conn.(%)= 46.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.44	0.52
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	80.00	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33

1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56

3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56

5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	73.69	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.86 (ii)	8.11 (ii)	
Unit Hyd. Tpeak (min)=	4.00	10.00	
Unit Hyd. peak (cms)=	0.42	0.13	
			TOTALS
PEAK FLOW (cms)=	0.19	0.08	0.265 (iii)
TIME TO PEAK (hrs)=	12.07	12.13	12.07
RUNOFF VOLUME (mm)=	127.60	51.56	86.53
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.40	0.67

***** 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 (0003)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0303):		9.16	0.528	12.50	44.18
+ ID2= 2 (0304):		0.96	0.265	12.07	86.53
ID = 3 (0003):		10.12	0.572	12.50	48.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0101)			
ID= 1 DT= 5.0 min	Area (ha)=	26.93	Curve Number (CN)= 58.9
	Ia (mm)=	8.06	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.46	

Unit Hyd Qpeak (cms)= 2.236

PEAK FLOW (cms)= 1.866 (i)
TIME TO PEAK (hrs)= 12.417

RUNOFF VOLUME (mm)= 49.438
TOTAL RAINFALL (mm)= 129.600
RUNOFF COEFFICIENT = 0.381

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

ADD HYD (0004)|	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):		26.93	1.866	12.42	49.44
+ ID2= 2 (0003):		10.12	0.572	12.50	48.20
ID = 3 (0004):		37.05	2.429	12.43	49.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0301)	Area (ha)= 3.27		
ID= 1 DT= 2.0 min	Total Imp(%)= 30.00	Dir. Conn.(%)= 30.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.98	2.29
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	147.65	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33

0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56

3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56

5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	73.69		
over (min)	5.00	12.00		
Storage Coeff. (min)=	2.68 (ii)	10.66 (ii)		
Unit Hyd. Tpeak (min)=	4.00	12.00		
Unit Hyd. peak (cms)=	0.35	0.10		
			TOTALS	
PEAK FLOW (cms)=	0.43	0.31	0.679 (iii)	
TIME TO PEAK (hrs)=	12.07	12.17	12.07	
RUNOFF VOLUME (mm)=	127.60	51.56	74.37	
TOTAL RAINFALL (mm)=	129.60	129.60	129.60	
RUNOFF COEFFICIENT =	0.98	0.40	0.57	

(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 (0302)	Area (ha)= 1.35
ID= 1 DT= 2.0 min	Total Imp(%)= 30.00 Dir. Conn.(%)= 20.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.41	0.94
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	94.87	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56

2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56

4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	91.73	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.06 (ii)	9.36 (ii)	
Unit Hyd. Tpeak (min)=	4.00	10.00	
Unit Hyd. peak (cms)=	0.40	0.12	
			TOTALS
PEAK FLOW (cms)=	0.12	0.17	0.273 (iii)
TIME TO PEAK (hrs)=	12.07	12.13	12.10
RUNOFF VOLUME (mm)=	127.60	56.07	70.37

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     TOTAL RAINFALL   (mm)=     129.60       129.60         129.60
     RUNOFF COEFFICIENT   =       0.98         0.43           0.54

***** 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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| CALIB             |
| STANDHYD (  0305)|   Area    (ha)=   0.23
|ID= 1 DT= 2.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  65.00
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                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.15         0.08
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      39.16        45.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
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---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33

1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56

3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56

5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	73.69	
over (min)	5.00	8.00	
Storage Coeff. (min)=	1.21 (ii)	6.13 (ii)	
Unit Hyd. Tpeak (min)=	4.00	8.00	
Unit Hyd. peak (cms)=	0.49	0.17	
			TOTALS
PEAK FLOW (cms)=	0.07	0.01	0.079 (iii)
TIME TO PEAK (hrs)=	12.07	12.10	12.07
RUNOFF VOLUME (mm)=	127.60	51.56	100.97
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.40	0.78

***** 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 (0001)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0302):	1.35	0.273	12.10	70.37	
+ ID2= 2 (0305):	0.23	0.079	12.07	100.97	
ID = 3 (0001):	1.58	0.348	12.07	74.83	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0002)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0001):	1.58	0.348	12.07	74.83	
+ ID2= 2 (0301):	3.27	0.679	12.07	74.37	
ID = 3 (0002):	4.85	1.027	12.07	74.52	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0005)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	4.85	1.027	12.07	74.52
	+ ID2= 2 (0004):	37.05	2.429	12.43	49.10
	ID = 3 (0005):	41.90	2.721	12.33	52.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0102) ID= 1 DT= 5.0 min				
	Area (ha)=	1.74	Curve Number (CN)=	68.6
	Ia (mm)=	8.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.22		

Unit Hyd Qpeak (cms)= 0.302

PEAK FLOW (cms)= 0.264 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 62.083
TOTAL RAINFALL (mm)= 129.600
RUNOFF COEFFICIENT = 0.479

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

ADD HYD (0006)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0102):	1.74	0.264	12.17	62.08
	+ ID2= 2 (0005):	41.90	2.721	12.33	52.04
	ID = 3 (0006):	43.64	2.921	12.33	52.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

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       V    V   I    SSSSS  U   U    A    L              (v 6.1.2002)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat
  Output              filename:       C:\Users\vsperandim\AppData\Local\Civica\VH5
\4ef9d6d3-9cba-4cfa-be0b-2fce60e5724c\dfbdfab3-373a-43b0-8ea4-c94ee2d5dbe6\s
  Summary          filename:          C:\Users\vsperandim\AppData\Local\Civica\VH5
\4ef9d6d3-9cba-4cfa-be0b-2fce60e5724c\dfbdfab3-373a-43b0-8ea4-c94ee2d5dbe6\s


DATE: 07-24-2023                                TIME: 01:56:10

USER:



COMMENTS: _____________________________________________________________________

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  **********************************************
  ** SIMULATION : Post-Dev-PF 100yr 24hr SCS    **
  **********************************************


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|    READ STORM    |    Filename: C:\Users\vsperandim\AppD
|                  |              ata\Local\Temp\
|                  |              aecfef2a-cff8-4f31-972e-e4abd235dbf8\1794a611
| Ptotal=129.60 mm |    Comments: 100yr 24hr SCS
--------------------
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TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.08	0.00	6.17	2.33	12.25	18.66	18.33	2.33
0.17	1.43	6.25	2.33	12.33	18.66	18.42	2.33
0.25	1.43	6.33	2.33	12.42	18.66	18.50	2.33
0.33	1.43	6.42	2.33	12.50	18.66	18.58	2.33
0.42	1.43	6.50	2.33	12.58	18.66	18.67	2.33
0.50	1.43	6.58	2.33	12.67	9.59	18.75	2.33
0.58	1.43	6.67	2.33	12.75	9.59	18.83	2.33
0.67	1.43	6.75	2.33	12.83	9.59	18.92	2.33
0.75	1.43	6.83	2.33	12.92	9.59	19.00	2.33
0.83	1.43	6.92	2.33	13.00	9.59	19.08	2.33
0.92	1.43	7.00	2.33	13.08	9.59	19.17	2.33
1.00	1.43	7.08	2.33	13.17	7.00	19.25	2.33

1.08	1.43	7.17	2.85	13.25	7.00	19.33	2.33
1.17	1.43	7.25	2.85	13.33	7.00	19.42	2.33
1.25	1.43	7.33	2.85	13.42	7.00	19.50	2.33
1.33	1.43	7.42	2.85	13.50	7.00	19.58	2.33
1.42	1.43	7.50	2.85	13.58	7.00	19.67	2.33
1.50	1.43	7.58	2.85	13.67	5.44	19.75	2.33
1.58	1.43	7.67	2.85	13.75	5.44	19.83	2.33
1.67	1.43	7.75	2.85	13.83	5.44	19.92	2.33
1.75	1.43	7.83	2.85	13.92	5.44	20.00	2.33
1.83	1.43	7.92	2.85	14.00	5.44	20.08	2.33
1.92	1.43	8.00	2.85	14.08	5.44	20.17	1.56
2.00	1.43	8.08	2.85	14.17	3.89	20.25	1.56
2.08	1.43	8.17	3.37	14.25	3.89	20.33	1.56
2.17	1.68	8.25	3.37	14.33	3.89	20.42	1.56
2.25	1.68	8.33	3.37	14.42	3.89	20.50	1.56
2.33	1.68	8.42	3.37	14.50	3.89	20.58	1.56
2.42	1.68	8.50	3.37	14.58	3.89	20.67	1.56
2.50	1.68	8.58	3.37	14.67	3.89	20.75	1.56
2.58	1.68	8.67	3.63	14.75	3.89	20.83	1.56
2.67	1.68	8.75	3.63	14.83	3.89	20.92	1.56
2.75	1.68	8.83	3.63	14.92	3.89	21.00	1.56
2.83	1.68	8.92	3.63	15.00	3.89	21.08	1.56
2.92	1.68	9.00	3.63	15.08	3.89	21.17	1.56
3.00	1.68	9.08	3.63	15.17	3.89	21.25	1.56
3.08	1.68	9.17	4.15	15.25	3.89	21.33	1.56
3.17	1.68	9.25	4.15	15.33	3.89	21.42	1.56
3.25	1.68	9.33	4.15	15.42	3.89	21.50	1.56
3.33	1.68	9.42	4.15	15.50	3.89	21.58	1.56
3.42	1.68	9.50	4.15	15.58	3.89	21.67	1.56
3.50	1.68	9.58	4.15	15.67	3.89	21.75	1.56
3.58	1.68	9.67	4.67	15.75	3.89	21.83	1.56
3.67	1.68	9.75	4.67	15.83	3.89	21.92	1.56
3.75	1.68	9.83	4.67	15.92	3.89	22.00	1.56
3.83	1.68	9.92	4.67	16.00	3.89	22.08	1.56
3.92	1.68	10.00	4.67	16.08	3.89	22.17	1.56
4.00	1.68	10.08	4.67	16.17	2.33	22.25	1.56
4.08	1.68	10.17	5.96	16.25	2.33	22.33	1.56
4.17	2.07	10.25	5.96	16.33	2.33	22.42	1.56
4.25	2.07	10.33	5.96	16.42	2.33	22.50	1.56
4.33	2.07	10.42	5.96	16.50	2.33	22.58	1.56
4.42	2.07	10.50	5.96	16.58	2.33	22.67	1.56
4.50	2.07	10.58	5.96	16.67	2.33	22.75	1.56
4.58	2.07	10.67	8.04	16.75	2.33	22.83	1.56
4.67	2.07	10.75	8.04	16.83	2.33	22.92	1.56
4.75	2.07	10.83	8.04	16.92	2.33	23.00	1.56
4.83	2.07	10.92	8.04	17.00	2.33	23.08	1.56
4.92	2.07	11.00	8.04	17.08	2.33	23.17	1.56
5.00	2.07	11.08	8.04	17.17	2.33	23.25	1.56
5.08	2.07	11.17	12.44	17.25	2.33	23.33	1.56
5.17	2.07	11.25	12.44	17.33	2.33	23.42	1.56
5.25	2.07	11.33	12.44	17.42	2.33	23.50	1.56
5.33	2.07	11.42	12.44	17.50	2.33	23.58	1.56
5.42	2.07	11.50	12.44	17.58	2.33	23.67	1.56
5.50	2.07	11.58	12.44	17.67	2.33	23.75	1.56
5.58	2.07	11.67	38.36	17.75	2.33	23.83	1.56
5.67	2.07	11.75	38.36	17.83	2.33	23.92	1.56
5.75	2.07	11.83	38.36	17.92	2.33	24.00	1.56
5.83	2.07	11.92	158.63	18.00	2.33	24.08	1.56
5.92	2.07	12.00	158.63	18.08	2.33		
6.00	2.07	12.08	158.63	18.17	2.33		
6.08	2.07	12.17	18.66	18.25	2.33		

CALIB			
NASHYD (0208)	Area (ha)=	2.30	Curve Number (CN)= 71.2
ID= 1 DT= 2.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.10	

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33

1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56

3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78

	6.033	2.07	12.067	158.63	18.100	2.33	

Unit Hyd Qpeak (cms)= 0.870

PEAK FLOW (cms)= 0.563 (i)
TIME TO PEAK (hrs)= 12.100
RUNOFF VOLUME (mm)= 68.237
TOTAL RAINFALL (mm)= 129.599
RUNOFF COEFFICIENT = 0.527

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

CALIB			
NASHYD (0303)	Area (ha)= 9.16	Curve Number (CN)= 54.8	
ID= 1 DT= 2.0 min	Ia (mm)= 8.80	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.50		

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33

1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56

3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56

5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Unit Hyd Qpeak (cms)= 0.700

PEAK FLOW (cms)= 0.528 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 44.179
TOTAL RAINFALL (mm)= 129.599
RUNOFF COEFFICIENT = 0.341

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

CALIB	
STANDHYD (0304)	Area (ha)= 0.96
ID= 1 DT= 2.0 min	Total Imp(%)= 46.00 Dir. Conn.(%)= 46.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.44	0.52
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	80.00	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33

0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56

2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56

4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	73.69	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.86 (ii)	8.11 (ii)	
Unit Hyd. Tpeak (min)=	4.00	10.00	
Unit Hyd. peak (cms)=	0.42	0.13	
			TOTALS
PEAK FLOW (cms)=	0.19	0.08	0.265 (iii)
TIME TO PEAK (hrs)=	12.07	12.13	12.07
RUNOFF VOLUME (mm)=	127.60	51.56	86.53
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.40	0.67

***** 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 (0004)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0303):	9.16	0.528	12.50	44.18
+ ID2= 2 (0304):	0.96	0.265	12.07	86.53
ID = 3 (0004):	10.12	0.572	12.50	48.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0201)	Area (ha)= 4.44
ID= 1 DT= 2.0 min	Total Imp(%)= 69.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.06	1.38
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	172.05	170.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33

1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56

3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56

5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63		221.13	
over (min)	5.00		16.00	
Storage Coeff. (min)=	2.94	(ii)	15.18	(ii)
Unit Hyd. Tpeak (min)=	4.00		16.00	
Unit Hyd. peak (cms)=	0.34		0.07	
				TOTALS
PEAK FLOW (cms)=	0.68		0.49	1.010 (iii)
TIME TO PEAK (hrs)=	12.07		12.23	12.10
RUNOFF VOLUME (mm)=	127.60		76.55	94.42
TOTAL RAINFALL (mm)=	129.60		129.60	129.60
RUNOFF COEFFICIENT =	0.98		0.59	0.73

(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	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
1 + 2 = 3	ID1= 1 (0201):	4.44	1.010	12.10	94.42
	+ ID2= 2 (0004):	10.12	0.572	12.50	48.20
	ID = 3 (0005):	14.56	1.505	12.10	62.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0202)	Area (ha)= 11.09
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	7.76	3.33
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	271.91	180.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33

0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56

2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56

4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	231.75	
over (min)	5.00	18.00	
Storage Coeff. (min)=	3.87 (ii)	16.30 (ii)	
Unit Hyd. Tpeak (min)=	4.00	18.00	
Unit Hyd. peak (cms)=	0.29	0.07	
			TOTALS
PEAK FLOW (cms)=	1.66	1.18	2.409 (iii)
TIME TO PEAK (hrs)=	12.07	12.27	12.10
RUNOFF VOLUME (mm)=	127.60	77.61	95.11
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.60	0.73

(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 (0301)	Area (ha)= 3.27
ID= 1 DT= 2.0 min	Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.98	2.29
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	147.65	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33

1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56

3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56

5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	73.69	
over (min)	5.00	12.00	
Storage Coeff. (min)=	2.68 (ii)	10.66 (ii)	
Unit Hyd. Tpeak (min)=	4.00	12.00	
Unit Hyd. peak (cms)=	0.35	0.10	
			TOTALS
PEAK FLOW (cms)=	0.43	0.31	0.679 (iii)
TIME TO PEAK (hrs)=	12.07	12.17	12.07
RUNOFF VOLUME (mm)=	127.60	51.56	74.37
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.40	0.57

(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 (0302)	Area (ha)= 1.35
ID= 1 DT= 2.0 min	Total Imp(%)= 30.00 Dir. Conn.(%)= 20.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.41	0.94
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	94.87	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33

0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56

2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56

4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	91.73	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.06 (ii)	9.36 (ii)	
Unit Hyd. Tpeak (min)=	4.00	10.00	
Unit Hyd. peak (cms)=	0.40	0.12	
			TOTALS
PEAK FLOW (cms)=	0.12	0.17	0.273 (iii)
TIME TO PEAK (hrs)=	12.07	12.13	12.10
RUNOFF VOLUME (mm)=	127.60	56.07	70.37
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.43	0.54

***** 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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| CALIB              |
| STANDHYD (  0305)|   Area    (ha)=   0.23
|ID= 1 DT= 2.0 min |   Total Imp(%)=  65.00   Dir. Conn.(%)=  65.00
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                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.15          0.08
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      39.16         45.00
     Mannings n             =     0.013         0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.
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---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33

1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56

3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56

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                5.800    2.07 |11.833   38.52 |17.867    2.33 | 23.90    1.56
                5.833    2.07 |11.867  158.63 |17.900    2.33 | 23.93    1.56
                5.867    2.07 |11.900  158.63 |17.933    2.33 | 23.97    1.56
                5.900    2.07 |11.933  158.63 |17.967    2.33 | 24.00    1.56
                5.933    2.07 |11.967  158.63 |18.000    2.33 | 24.03    1.56
                5.967    2.07 |12.000  158.63 |18.033    2.33 | 24.07    1.56
                6.000    2.07 |12.033  158.63 |18.067    2.33 | 24.10    0.78
                6.033    2.07 |12.067  158.63 |18.100    2.33 |

     Max.Eff.Inten.(mm/hr)=     158.63        73.69
               over (min)         5.00         8.00
     Storage Coeff.  (min)=       1.21 (ii)    6.13 (ii)
     Unit Hyd. Tpeak (min)=       4.00         8.00
     Unit Hyd. peak  (cms)=       0.49         0.17
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.01          0.079 (iii)
     TIME TO PEAK    (hrs)=      12.07        12.10          12.07
     RUNOFF VOLUME    (mm)=     127.60        51.56         100.97
     TOTAL RAINFALL   (mm)=     129.60       129.60         129.60
     RUNOFF COEFFICIENT   =       0.98         0.40           0.78

***** 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  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0302):     1.35   0.273    12.10    70.37
      + ID2= 2 (  0305):     0.23   0.079    12.07   100.97
        ==================================================
        ID = 3 (  0001):     1.58   0.348    12.07    74.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0002)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     1.58   0.348    12.07    74.83
      + ID2= 2 (  0301):     3.27   0.679    12.07    74.37
        ==================================================
        ID = 3 (  0002):     4.85   1.027    12.07    74.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):     4.85   1.027    12.07    74.52
      + ID2= 2 (  0202):    11.09   2.409    12.10    95.11
        ==================================================
        ID = 3 (  0003):    15.94   3.426    12.10    88.84
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0006)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0003):	15.94	3.426	12.10	88.84
+ ID2= 2 (0005):	14.56	1.505	12.10	62.29
ID = 3 (0006):	30.50	4.932	12.10	76.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0207) ID= 1 DT= 2.0 min	Area (ha)= 1.35	Total Imp(%)= 46.00	Dir. Conn.(%)= 46.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.73
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	94.87	450.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33

1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56

3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56

5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	28.77	
over (min)	5.00	52.00	
Storage Coeff. (min)=	2.06 (ii)	51.69 (ii)	
Unit Hyd. Tpeak (min)=	4.00	52.00	
Unit Hyd. peak (cms)=	0.40	0.02	
			TOTALS
PEAK FLOW (cms)=	0.27	0.04	0.282 (iii)
TIME TO PEAK (hrs)=	12.07	12.83	12.07
RUNOFF VOLUME (mm)=	127.60	51.55	86.51
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.40	0.67

(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 (0203)	Area (ha)= 5.17
ID= 1 DT= 2.0 min	Total Imp(%)= 75.00 Dir. Conn.(%)= 38.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.88	1.29
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	185.65	190.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33

0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56

2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56

4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	285.12	
over (min)	5.00	16.00	
Storage Coeff. (min)=	3.08 (ii)	14.90 (ii)	
Unit Hyd. Tpeak (min)=	4.00	16.00	
Unit Hyd. peak (cms)=	0.33	0.07	
			TOTALS
PEAK FLOW (cms)=	0.85	0.59	1.257 (iii)
TIME TO PEAK (hrs)=	12.07	12.23	12.10
RUNOFF VOLUME (mm)=	127.59	81.89	99.26
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.63	0.77

(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 (0204)	Area (ha)= 1.27
ID= 1 DT= 2.0 min	Total Imp(%)= 71.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.90	0.37
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	92.01	170.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33

1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56

3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56

5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	247.83		
over (min)	5.00	14.00		
Storage Coeff. (min)=	2.02 (ii)	13.72 (ii)		
Unit Hyd. Tpeak (min)=	4.00	14.00		
Unit Hyd. peak (cms)=	0.41	0.08		
			TOTALS	
PEAK FLOW (cms)=	0.20	0.15	0.311 (iii)	
TIME TO PEAK (hrs)=	12.07	12.20	12.07	
RUNOFF VOLUME (mm)=	127.60	78.70	95.81	
TOTAL RAINFALL (mm)=	129.60	129.60	129.60	
RUNOFF COEFFICIENT =	0.98	0.61	0.74	

(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 (0009)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0203):	5.17	1.257	12.10	99.26	
+ ID2= 2 (0204):	1.27	0.311	12.07	95.81	
ID = 3 (0009):	6.44	1.566	12.07	98.58	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0205)	Area (ha)= 1.25		
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00	Dir. Conn.(%)= 35.00	
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.87	0.38	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	1.00	2.00	
Length (m)=	91.29	170.00	
Mannings n =	0.013	0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr

0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56

2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56

4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	236.28	
over (min)	5.00	14.00	
Storage Coeff. (min)=	2.01 (ii)	13.93 (ii)	
Unit Hyd. Tpeak (min)=	4.00	14.00	
Unit Hyd. peak (cms)=	0.41	0.08	
			TOTALS
PEAK FLOW (cms)=	0.19	0.15	0.303 (iii)
TIME TO PEAK (hrs)=	12.07	12.20	12.07
RUNOFF VOLUME (mm)=	127.60	77.61	95.10
TOTAL RAINFALL (mm)=	129.60	129.60	129.60

RUNOFF COEFFICIENT = 0.98 0.60 0.73

(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 (0012)|
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0205):	1.25	0.303	12.07	95.10
+ ID2= 2 (0009):	6.44	1.566	12.07	98.58
ID = 3 (0012):	7.69	1.870	12.07	98.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| STANDHYD (0206)| Area (ha)= 0.99
|ID= 1 DT= 2.0 min | Total Imp(%)= 69.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.31
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	81.24	165.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33

0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33
1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56

2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56
4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56

5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Max.Eff.Inten.(mm/hr)=	158.63	225.55	
over (min)	5.00	14.00	
Storage Coeff. (min)=	1.88 (ii)	13.80 (ii)	
Unit Hyd. Tpeak (min)=	4.00	14.00	
Unit Hyd. peak (cms)=	0.42	0.08	
			TOTALS
PEAK FLOW (cms)=	0.15	0.12	0.239 (iii)
TIME TO PEAK (hrs)=	12.07	12.20	12.07
RUNOFF VOLUME (mm)=	127.60	76.55	94.41
TOTAL RAINFALL (mm)=	129.60	129.60	129.60
RUNOFF COEFFICIENT =	0.98	0.59	0.73

***** 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 (0015)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0012):	7.69	1.870	12.07	98.02
+ ID2= 2 (0206):	0.99	0.239	12.07	94.41
ID = 3 (0015):	8.68	2.109	12.07	97.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0015):      8.68   2.109    12.07    97.61
     + ID2= 2 (  0207):      1.35   0.282    12.07    86.51
       ================================================
       ID = 3 (  0018):     10.03   2.392    12.07    96.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0018)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0018):     10.03   2.392    12.07    96.11
     + ID2= 2 (  0208):      2.30   0.563    12.10    68.24
       ================================================
       ID = 1 (  0018):     12.33   2.938    12.07    90.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0018):     12.33   2.938    12.07    90.91
     + ID2= 2 (  0006):     30.50   4.932    12.10    76.17
       ================================================
       ID = 3 (  0018):     42.83   7.851    12.10    80.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.8460      1.2694
                          0.0020     0.0418    |   1.1050      1.4542
                          0.0130     0.1284    |   1.3760      1.7075
                          0.0230     0.2663    |   1.5470      1.9027
                          0.0340     0.5192    |   2.0070      1.9688
                          0.1240     0.5741    |   2.8220      2.0353
                          0.1600     0.7981    |   3.8860      2.1024
                          0.2350     0.9712    |   6.6480      2.2381
                          0.2720     1.0299    |   8.3180      2.3067
                          0.6110     1.1487    |  12.2030      2.4574

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)     42.830      7.851     12.10      80.41
   OUTFLOW: ID= 1 (  0500)     42.830      1.429     12.97      75.77

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.21
                  TIME SHIFT OF PEAK FLOW         (min)= 52.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.7685

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| CALIB            |
| NASHYD   (  0209)|   Area    (ha)=   0.81   Curve Number   (CN)= 59.0
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|ID= 1 DT= 2.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.04

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	0.00	6.067	2.07	12.100	88.45	18.13	2.33
0.067	0.00	6.100	2.20	12.133	18.66	18.17	2.33
0.100	0.71	6.133	2.33	12.167	18.66	18.20	2.33
0.133	1.43	6.167	2.33	12.200	18.66	18.23	2.33
0.167	1.43	6.200	2.33	12.233	18.66	18.27	2.33
0.200	1.43	6.233	2.33	12.267	18.66	18.30	2.33
0.233	1.43	6.267	2.33	12.300	18.66	18.33	2.33
0.267	1.43	6.300	2.33	12.333	18.66	18.37	2.33
0.300	1.43	6.333	2.33	12.367	18.66	18.40	2.33
0.333	1.43	6.367	2.33	12.400	18.66	18.43	2.33
0.367	1.43	6.400	2.33	12.433	18.66	18.47	2.33
0.400	1.43	6.433	2.33	12.467	18.66	18.50	2.33
0.433	1.43	6.467	2.33	12.500	18.66	18.53	2.33
0.467	1.43	6.500	2.33	12.533	18.66	18.57	2.33
0.500	1.43	6.533	2.33	12.567	18.66	18.60	2.33
0.533	1.43	6.567	2.33	12.600	14.11	18.63	2.33
0.567	1.43	6.600	2.33	12.633	9.59	18.67	2.33
0.600	1.43	6.633	2.33	12.667	9.59	18.70	2.33
0.633	1.43	6.667	2.33	12.700	9.59	18.73	2.33
0.667	1.43	6.700	2.33	12.733	9.59	18.77	2.33
0.700	1.43	6.733	2.33	12.767	9.59	18.80	2.33
0.733	1.43	6.767	2.33	12.800	9.59	18.83	2.33
0.767	1.43	6.800	2.33	12.833	9.59	18.87	2.33
0.800	1.43	6.833	2.33	12.867	9.59	18.90	2.33
0.833	1.43	6.867	2.33	12.900	9.59	18.93	2.33
0.867	1.43	6.900	2.33	12.933	9.59	18.97	2.33
0.900	1.43	6.933	2.33	12.967	9.59	19.00	2.33
0.933	1.43	6.967	2.33	13.000	9.59	19.03	2.33
0.967	1.43	7.000	2.33	13.033	9.59	19.07	2.33
1.000	1.43	7.033	2.33	13.067	9.59	19.10	2.33
1.033	1.43	7.067	2.33	13.100	8.29	19.13	2.33
1.067	1.43	7.100	2.59	13.133	7.00	19.17	2.33
1.100	1.43	7.133	2.85	13.167	7.00	19.20	2.33
1.133	1.43	7.167	2.85	13.200	7.00	19.23	2.33
1.167	1.43	7.200	2.85	13.233	7.00	19.27	2.33
1.200	1.43	7.233	2.85	13.267	7.00	19.30	2.33
1.233	1.43	7.267	2.85	13.300	7.00	19.33	2.33
1.267	1.43	7.300	2.85	13.333	7.00	19.37	2.33
1.300	1.43	7.333	2.85	13.367	7.00	19.40	2.33
1.333	1.43	7.367	2.85	13.400	7.00	19.43	2.33
1.367	1.43	7.400	2.85	13.433	7.00	19.47	2.33
1.400	1.43	7.433	2.85	13.467	7.00	19.50	2.33
1.433	1.43	7.467	2.85	13.500	7.00	19.53	2.33
1.467	1.43	7.500	2.85	13.533	7.00	19.57	2.33
1.500	1.43	7.533	2.85	13.567	7.00	19.60	2.33
1.533	1.43	7.567	2.85	13.600	6.22	19.63	2.33
1.567	1.43	7.600	2.85	13.633	5.44	19.67	2.33
1.600	1.43	7.633	2.85	13.667	5.44	19.70	2.33
1.633	1.43	7.667	2.85	13.700	5.44	19.73	2.33
1.667	1.43	7.700	2.85	13.733	5.44	19.77	2.33
1.700	1.43	7.733	2.85	13.767	5.44	19.80	2.33
1.733	1.43	7.767	2.85	13.800	5.44	19.83	2.33
1.767	1.43	7.800	2.85	13.833	5.44	19.87	2.33
1.800	1.43	7.833	2.85	13.867	5.44	19.90	2.33
1.833	1.43	7.867	2.85	13.900	5.44	19.93	2.33

1.867	1.43	7.900	2.85	13.933	5.44	19.97	2.33
1.900	1.43	7.933	2.85	13.967	5.44	20.00	2.33
1.933	1.43	7.967	2.85	14.000	5.44	20.03	2.33
1.967	1.43	8.000	2.85	14.033	5.44	20.07	2.33
2.000	1.43	8.033	2.85	14.067	5.44	20.10	1.94
2.033	1.43	8.067	2.85	14.100	4.66	20.13	1.56
2.067	1.43	8.100	3.11	14.133	3.89	20.17	1.56
2.100	1.56	8.133	3.37	14.167	3.89	20.20	1.56
2.133	1.68	8.167	3.37	14.200	3.89	20.23	1.56
2.167	1.68	8.200	3.37	14.233	3.89	20.27	1.56
2.200	1.68	8.233	3.37	14.267	3.89	20.30	1.56
2.233	1.68	8.267	3.37	14.300	3.89	20.33	1.56
2.267	1.68	8.300	3.37	14.333	3.89	20.37	1.56
2.300	1.68	8.333	3.37	14.367	3.89	20.40	1.56
2.333	1.68	8.367	3.37	14.400	3.89	20.43	1.56
2.367	1.68	8.400	3.37	14.433	3.89	20.47	1.56
2.400	1.68	8.433	3.37	14.467	3.89	20.50	1.56
2.433	1.68	8.467	3.37	14.500	3.89	20.53	1.56
2.467	1.68	8.500	3.37	14.533	3.89	20.57	1.56
2.500	1.68	8.533	3.37	14.567	3.89	20.60	1.56
2.533	1.68	8.567	3.37	14.600	3.89	20.63	1.56
2.567	1.68	8.600	3.50	14.633	3.89	20.67	1.56
2.600	1.68	8.633	3.63	14.667	3.89	20.70	1.56
2.633	1.68	8.667	3.63	14.700	3.89	20.73	1.56
2.667	1.68	8.700	3.63	14.733	3.89	20.77	1.56
2.700	1.68	8.733	3.63	14.767	3.89	20.80	1.56
2.733	1.68	8.767	3.63	14.800	3.89	20.83	1.56
2.767	1.68	8.800	3.63	14.833	3.89	20.87	1.56
2.800	1.68	8.833	3.63	14.867	3.89	20.90	1.56
2.833	1.68	8.867	3.63	14.900	3.89	20.93	1.56
2.867	1.68	8.900	3.63	14.933	3.89	20.97	1.56
2.900	1.68	8.933	3.63	14.967	3.89	21.00	1.56
2.933	1.68	8.967	3.63	15.000	3.89	21.03	1.56
2.967	1.68	9.000	3.63	15.033	3.89	21.07	1.56
3.000	1.68	9.033	3.63	15.067	3.89	21.10	1.56
3.033	1.68	9.067	3.63	15.100	3.89	21.13	1.56
3.067	1.68	9.100	3.89	15.133	3.89	21.17	1.56
3.100	1.68	9.133	4.15	15.167	3.89	21.20	1.56
3.133	1.68	9.167	4.15	15.200	3.89	21.23	1.56
3.167	1.68	9.200	4.15	15.233	3.89	21.27	1.56
3.200	1.68	9.233	4.15	15.267	3.89	21.30	1.56
3.233	1.68	9.267	4.15	15.300	3.89	21.33	1.56
3.267	1.68	9.300	4.15	15.333	3.89	21.37	1.56
3.300	1.68	9.333	4.15	15.367	3.89	21.40	1.56
3.333	1.68	9.367	4.15	15.400	3.89	21.43	1.56
3.367	1.68	9.400	4.15	15.433	3.89	21.47	1.56
3.400	1.68	9.433	4.15	15.467	3.89	21.50	1.56
3.433	1.68	9.467	4.15	15.500	3.89	21.53	1.56
3.467	1.68	9.500	4.15	15.533	3.89	21.57	1.56
3.500	1.68	9.533	4.15	15.567	3.89	21.60	1.56
3.533	1.68	9.567	4.15	15.600	3.89	21.63	1.56
3.567	1.68	9.600	4.41	15.633	3.89	21.67	1.56
3.600	1.68	9.633	4.67	15.667	3.89	21.70	1.56
3.633	1.68	9.667	4.67	15.700	3.89	21.73	1.56
3.667	1.68	9.700	4.67	15.733	3.89	21.77	1.56
3.700	1.68	9.733	4.67	15.767	3.89	21.80	1.56
3.733	1.68	9.767	4.67	15.800	3.89	21.83	1.56
3.767	1.68	9.800	4.67	15.833	3.89	21.87	1.56
3.800	1.68	9.833	4.67	15.867	3.89	21.90	1.56
3.833	1.68	9.867	4.67	15.900	3.89	21.93	1.56
3.867	1.68	9.900	4.67	15.933	3.89	21.97	1.56
3.900	1.68	9.933	4.67	15.967	3.89	22.00	1.56
3.933	1.68	9.967	4.67	16.000	3.89	22.03	1.56
3.967	1.68	10.000	4.67	16.033	3.89	22.07	1.56

4.000	1.68	10.033	4.67	16.067	3.89	22.10	1.56
4.033	1.68	10.067	4.67	16.100	3.11	22.13	1.56
4.067	1.68	10.100	5.31	16.133	2.33	22.17	1.56
4.100	1.88	10.133	5.96	16.167	2.33	22.20	1.56
4.133	2.07	10.167	5.96	16.200	2.33	22.23	1.56
4.167	2.07	10.200	5.96	16.233	2.33	22.27	1.56
4.200	2.07	10.233	5.96	16.267	2.33	22.30	1.56
4.233	2.07	10.267	5.96	16.300	2.33	22.33	1.56
4.267	2.07	10.300	5.96	16.333	2.33	22.37	1.56
4.300	2.07	10.333	5.96	16.367	2.33	22.40	1.56
4.333	2.07	10.367	5.96	16.400	2.33	22.43	1.56
4.367	2.07	10.400	5.96	16.433	2.33	22.47	1.56
4.400	2.07	10.433	5.96	16.467	2.33	22.50	1.56
4.433	2.07	10.467	5.96	16.500	2.33	22.53	1.56
4.467	2.07	10.500	5.96	16.533	2.33	22.57	1.56
4.500	2.07	10.533	5.96	16.567	2.33	22.60	1.56
4.533	2.07	10.567	5.96	16.600	2.33	22.63	1.56
4.567	2.07	10.600	7.00	16.633	2.33	22.67	1.56
4.600	2.07	10.633	8.04	16.667	2.33	22.70	1.56
4.633	2.07	10.667	8.04	16.700	2.33	22.73	1.56
4.667	2.07	10.700	8.04	16.733	2.33	22.77	1.56
4.700	2.07	10.733	8.04	16.767	2.33	22.80	1.56
4.733	2.07	10.767	8.04	16.800	2.33	22.83	1.56
4.767	2.07	10.800	8.04	16.833	2.33	22.87	1.56
4.800	2.07	10.833	8.04	16.867	2.33	22.90	1.56
4.833	2.07	10.867	8.04	16.900	2.33	22.93	1.56
4.867	2.07	10.900	8.04	16.933	2.33	22.97	1.56
4.900	2.07	10.933	8.04	16.967	2.33	23.00	1.56
4.933	2.07	10.967	8.04	17.000	2.33	23.03	1.56
4.967	2.07	11.000	8.04	17.033	2.33	23.07	1.56
5.000	2.07	11.033	8.04	17.067	2.33	23.10	1.56
5.033	2.07	11.067	8.04	17.100	2.33	23.13	1.56
5.067	2.07	11.100	10.24	17.133	2.33	23.17	1.56
5.100	2.07	11.133	12.44	17.167	2.33	23.20	1.56
5.133	2.07	11.167	12.44	17.200	2.33	23.23	1.56
5.167	2.07	11.200	12.44	17.233	2.33	23.27	1.56
5.200	2.07	11.233	12.44	17.267	2.33	23.30	1.56
5.233	2.07	11.267	12.44	17.300	2.33	23.33	1.56
5.267	2.07	11.300	12.44	17.333	2.33	23.37	1.56
5.300	2.07	11.333	12.44	17.367	2.33	23.40	1.56
5.333	2.07	11.367	12.44	17.400	2.33	23.43	1.56
5.367	2.07	11.400	12.44	17.433	2.33	23.47	1.56
5.400	2.07	11.433	12.44	17.467	2.33	23.50	1.56
5.433	2.07	11.467	12.44	17.500	2.33	23.53	1.56
5.467	2.07	11.500	12.44	17.533	2.33	23.57	1.56
5.500	2.07	11.533	12.44	17.567	2.33	23.60	1.56
5.533	2.07	11.567	12.44	17.600	2.33	23.63	1.56
5.567	2.07	11.600	25.43	17.633	2.33	23.67	1.56
5.600	2.07	11.633	38.36	17.667	2.33	23.70	1.56
5.633	2.07	11.667	38.36	17.700	2.33	23.73	1.56
5.667	2.07	11.700	38.36	17.733	2.33	23.77	1.56
5.700	2.07	11.733	38.36	17.767	2.33	23.80	1.56
5.733	2.07	11.767	38.36	17.800	2.33	23.83	1.56
5.767	2.07	11.800	38.36	17.833	2.33	23.87	1.56
5.800	2.07	11.833	38.52	17.867	2.33	23.90	1.56
5.833	2.07	11.867	158.63	17.900	2.33	23.93	1.56
5.867	2.07	11.900	158.63	17.933	2.33	23.97	1.56
5.900	2.07	11.933	158.63	17.967	2.33	24.00	1.56
5.933	2.07	11.967	158.63	18.000	2.33	24.03	1.56
5.967	2.07	12.000	158.63	18.033	2.33	24.07	1.56
6.000	2.07	12.033	158.63	18.067	2.33	24.10	0.78
6.033	2.07	12.067	158.63	18.100	2.33		

Unit Hyd Qpeak (cms)= 0.793

```
     PEAK FLOW       (cms)=   0.171 (i)
     TIME TO PEAK    (hrs)=  12.067
     RUNOFF VOLUME    (mm)=  50.092
     TOTAL RAINFALL   (mm)= 129.599
     RUNOFF COEFFICIENT   =   0.387

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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--------------------
| ADD HYD  (  0019)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0209):     0.81   0.171    12.07    50.09
      + ID2= 2 (  0500):    42.83   1.429    12.97    75.77
        ==========================================================
        ID = 3 (  0019):    43.64   1.441    12.97    75.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 6.1.2002)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.1\VO2\voin.dat
  Output              filename:       C:\Users\vsperandim\AppData\Local\Civica\VH5
\4ef9d6d3-9cba-4cfa-be0b-2fce60e5724c\adf3af17-4329-4eae-8e01-432ed39098b4\s
  Summary          filename:          C:\Users\vsperandim\AppData\Local\Civica\VH5
\4ef9d6d3-9cba-4cfa-be0b-2fce60e5724c\adf3af17-4329-4eae-8e01-432ed39098b4\s


DATE: 07-24-2023                              TIME: 01:16:09

USER:



COMMENTS: _____________________________________________________________


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  ************************************************
  ** SIMULATION : Post-Dev-LID WQE               **
  ************************************************


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|    READ STORM    |    Filename: C:\Users\vsperandim\AppD
|                  |              ata\Local\Temp\
|                  |              8d732a4e-9188-4759-830a-c44b24ce9b29\8bcdb721
| Ptotal= 25.00 mm |    Comments: Twenty-Five mm Four Hour Chicago Storm
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    2.07 |  1.17    5.70 |  2.17    5.19 |  3.17    2.80
                0.33    2.27 |  1.33   10.78 |  2.33    4.47 |  3.33    2.62
                0.50    2.52 |  1.50   50.21 |  2.50    3.95 |  3.50    2.48
                0.67    2.88 |  1.67   13.37 |  2.67    3.56 |  3.67    2.35
                0.83    3.38 |  1.83    8.29 |  2.83    3.25 |  3.83    2.23
                1.00    4.18 |  2.00    6.30 |  3.00    3.01 |  4.00    2.14

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| CALIB            |
| NASHYD   (  0209)|   Area    (ha)=   0.81   Curve Number   (CN)= 59.0
```

|ID= 1 DT= 2.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.04

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.793

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 1.977
TOTAL RAINFALL (mm)= 24.996
RUNOFF COEFFICIENT = 0.079

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

| CALIB |
| NASHYD (0208)|
|ID= 1 DT= 2.0 min |

Area (ha)= 2.30 Curve Number (CN)= 71.2
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.10

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80

0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.878

PEAK FLOW (cms)= 0.024 (i)
TIME TO PEAK (hrs)= 1.567
RUNOFF VOLUME (mm)= 3.255
TOTAL RAINFALL (mm)= 24.996
RUNOFF COEFFICIENT = 0.130

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

CALIB
STANDHYD (0207)
ID= 1 DT= 2.0 min

Area (ha)= 1.35
Total Imp(%)= 46.00 Dir. Conn.(%)= 46.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.62	0.73
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	94.87	450.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80

0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)=	50.21	1.21	
over (min)	5.00	180.00	
Storage Coeff. (min)=	3.26 (ii)	179.39 (ii)	
Unit Hyd. Tpeak (min)=	4.00	180.00	
Unit Hyd. peak (cms)=	0.32	0.01	
			TOTALS
PEAK FLOW (cms)=	0.08	0.00	0.082 (iii)
TIME TO PEAK (hrs)=	1.50	5.13	1.50
RUNOFF VOLUME (mm)=	23.00	2.03	11.60
TOTAL RAINFALL (mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT =	0.92	0.08	0.46

(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 (0206)	Area (ha)= 0.99
ID= 1 DT= 2.0 min	Total Imp(%)= 69.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.31
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	81.24	165.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr

0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)=	50.21	7.14	
over (min)	5.00	52.00	
Storage Coeff. (min)=	2.97 (ii)	50.44 (ii)	
Unit Hyd. Tpeak (min)=	4.00	52.00	
Unit Hyd. peak (cms)=	0.33	0.02	
			TOTALS
PEAK FLOW (cms)=	0.05	0.00	0.046 (iii)
TIME TO PEAK (hrs)=	1.50	2.47	1.50
RUNOFF VOLUME (mm)=	23.00	4.79	11.13
TOTAL RAINFALL (mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT =	0.92	0.19	0.45

(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 (0205)	Area (ha)= 1.25
ID= 1 DT= 2.0 min	Total Imp(%)= 70.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.87	0.38
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	91.29	170.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)=	50.21	7.63		
over (min)	5.00	52.00		
Storage Coeff. (min)=	3.19 (ii)	50.25 (ii)		
Unit Hyd. Tpeak (min)=	4.00	52.00		
Unit Hyd. peak (cms)=	0.32	0.02		
			TOTALS	
PEAK FLOW (cms)=	0.06	0.00	0.058 (iii)	
TIME TO PEAK (hrs)=	1.50	2.47	1.50	
RUNOFF VOLUME (mm)=	23.00	4.94	11.24	
TOTAL RAINFALL (mm)=	25.00	25.00	25.00	
RUNOFF COEFFICIENT =	0.92	0.20	0.45	

(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 (0204)	Area (ha)= 1.27
ID= 1 DT= 2.0 min	Total Imp(%)= 71.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.90	0.37
Dep. Storage	(mm)=	2.00	5.00

Average Slope	(%)=	1.00	2.00
Length	(m)=	92.01	170.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)=		50.21	8.36	
over (min)		5.00	50.00	
Storage Coeff. (min)=		3.20 (ii)	48.58 (ii)	
Unit Hyd. Tpeak (min)=		4.00	50.00	
Unit Hyd. peak (cms)=		0.32	0.02	
				TOTALS
PEAK FLOW	(cms)=	0.06	0.00	0.059 (iii)
TIME TO PEAK	(hrs)=	1.50	2.43	1.50
RUNOFF VOLUME	(mm)=	23.00	5.11	11.35
TOTAL RAINFALL	(mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT	=	0.92	0.20	0.45

(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 (0203)	Area (ha)= 5.17

|ID= 1 DT= 2.0 min | Total Imp(%)= 75.00 Dir. Conn.(%)= 38.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.88	1.29
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	185.65	190.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)=		50.21	10.22	
over (min)		5.00	50.00	
Storage Coeff. (min)=		4.88 (ii)	49.64 (ii)	
Unit Hyd. Tpeak (min)=		4.00	50.00	
Unit Hyd. peak (cms)=		0.24	0.02	
				TOTALS
PEAK FLOW	(cms)=	0.24	0.02	0.239 (iii)
TIME TO PEAK	(hrs)=	1.50	2.43	1.50
RUNOFF VOLUME	(mm)=	23.00	5.61	12.21
TOTAL RAINFALL	(mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT	=	0.92	0.22	0.49

(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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-------------------------------------------------------------------------------
------------------
| SWALE(  0007)  |  SURFACE PONDING LAYER:
|IN= 2--> OUT= 3 |  Length          (m)=   60.00  Height           (m)=    0.30
|DT=  1.0 MIN    |  Left Slope        =    3.00  Right Slope        =    3.00
------------------  Bottom Width    (m)=    2.00  Surface slope(%)    =    0.50

                    STORAGE LAYER:
                    Depth           (m)=    0.60  Porosity           =    0.40

                    NATIVE SOIL LAYER:
                    Infiltration (m/hr) = 0.0244

                       AREA         QPEAK            TPEAK         R.V.
                       (ha)         (cms)            (hrs)         (mm)
     INFLOW:ID= 2     5.17         0.239             1.50        12.21
    OUTFLOW:ID= 1     0.00         0.000             0.00         0.00
   OVERFLOW:ID= 3     5.17         0.238             1.50        10.53

              Volume Reduction Rate[(RVin-RVout)/RVin](%)=       13.77
              Maximum ponding/storage volume      (cu.m.)=       54.90
              Time to reach Max storage              (Hr)=        1.35
              Volume of water for drawdown in LID (cu.m.)=       47.18
              Calculated Drawdown Time               (Hr)=       20.38

  --------------------------
  | Junction Command(0008) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 3(  0007)    5.17     0.24    1.50    10.53
  OUTFLOW: ID= 2(  0008)    5.17     0.24    1.50    10.53

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

--------------------
| ADD HYD  (  0009)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0204):     1.27   0.059     1.50    11.35
      + ID2= 2 (  0008):     5.17   0.238     1.50    10.53
        ================================================
        ID = 3 (  0009):     6.44   0.297     1.50    10.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
------------------
| SWALE(  0010)  |  SURFACE PONDING LAYER:
|IN= 2--> OUT= 3 |  Length          (m)=   60.00  Height           (m)=    0.30
|DT=  1.0 MIN    |  Left Slope        =    3.00  Right Slope        =    3.00
------------------  Bottom Width    (m)=    2.00  Surface slope(%)    =    0.50

                    STORAGE LAYER:
                    Depth           (m)=    1.00  Porosity           =    0.40

                    NATIVE SOIL LAYER:
                    Infiltration (m/hr) = 0.0020

                       AREA         QPEAK            TPEAK         R.V.
                       (ha)         (cms)            (hrs)         (mm)
     INFLOW:ID= 2     6.44         0.297             1.50        10.69
    OUTFLOW:ID= 1     0.00         0.000             0.00         0.00
```

```
  OVERFLOW:ID= 3     6.44         0.297             1.50          9.50

            Volume Reduction Rate[(RVin-RVout)/RVin](%)=       11.15
            Maximum ponding/storage volume      (cu.m.)=       74.10
            Time to reach Max storage              (Hr)=        1.45
            Volume of water for drawdown in LID (cu.m.)=       74.09
            Calculated Drawdown Time               (Hr)=      326.25

  --------------------------
  | Junction Command(0011) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 3(  0010)    6.44     0.30    1.50     9.50
  OUTFLOW: ID= 2(  0011)    6.44     0.30    1.50     9.50

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


--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0011):     6.44   0.297     1.50     9.50
     + ID2= 2 (  0205):     1.25   0.058     1.50    11.24
       ================================================
       ID = 3 (  0012):     7.69   0.355     1.50     9.78

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
------------------
| SWALE(  0013)  |  SURFACE PONDING LAYER:
|IN= 2--> OUT= 3 |  Length          (m)=   60.00  Height           (m)=    0.30
|DT=  1.0 MIN    |  Left Slope         =    3.00  Right Slope         =    3.00
------------------  Bottom Width    (m)=    2.00  Surface slope(%)    =    0.50

                    STORAGE LAYER:
                    Depth           (m)=    1.00  Porosity            =    0.40

                    NATIVE SOIL LAYER:
                    Infiltration (m/hr) = 0.0020

                       AREA         QPEAK            TPEAK         R.V.
                       (ha)         (cms)            (hrs)         (mm)
     INFLOW:ID= 2     7.69         0.355             1.50          9.78
    OUTFLOW:ID= 1     0.00         0.000             0.00          0.00
   OVERFLOW:ID= 3     7.69         0.355             1.50          8.78

            Volume Reduction Rate[(RVin-RVout)/RVin](%)=       10.21
            Maximum ponding/storage volume      (cu.m.)=       74.10
            Time to reach Max storage              (Hr)=        1.48
            Volume of water for drawdown in LID (cu.m.)=       74.09
            Calculated Drawdown Time               (Hr)=      326.18

  --------------------------
  | Junction Command(0014) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 3(  0013)    7.69     0.35    1.50     8.78
  OUTFLOW: ID= 2(  0014)    7.69     0.35    1.50     8.78

  ------------------------------------------------------------------------------
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--------------------
| ADD HYD  (  0015)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0014):     7.69   0.355     1.50     8.78
      + ID2= 2 (  0206):     0.99   0.046     1.50    11.13
        ================================================
        ID = 3 (  0015):     8.68   0.401     1.50     9.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
------------------
| SWALE(  0016)  |  SURFACE PONDING LAYER:
|IN= 2--> OUT= 3 |  Length          (m)=   60.00  Height          (m)=    0.30
|DT=  1.0 MIN    |  Left Slope         =    3.00  Right Slope        =    3.00
------------------  Bottom Width    (m)=    2.00  Surface slope(%)   =    0.50

                    STORAGE LAYER:
                    Depth           (m)=    1.00  Porosity           =    0.40

                    NATIVE SOIL LAYER:
                    Infiltration (m/hr) = 0.0020

                       AREA         QPEAK            TPEAK         R.V.
                       (ha)         (cms)            (hrs)         (mm)
     INFLOW:ID= 2     8.68         0.401             1.50         9.05
    OUTFLOW:ID= 1     0.00         0.000             0.00         0.00
   OVERFLOW:ID= 3     8.68         0.365             1.53         8.17

              Volume Reduction Rate[(RVin-RVout)/RVin](%)=        9.76
              Maximum ponding/storage volume      (cu.m.)=       74.10
              Time to reach Max storage              (Hr)=        1.52
              Volume of water for drawdown in LID (cu.m.)=       74.08
              Calculated Drawdown Time               (Hr)=      326.35

  --------------------------
  | Junction Command(0017) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 3(  0016)    8.68     0.37    1.53     8.17
  OUTFLOW: ID= 2(  0017)    8.68     0.37    1.53     8.17

  -------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD (  0202)|   Area    (ha)=  11.09
|ID= 1 DT= 2.0 min |   Total Imp(%)=  70.00   Dir. Conn.(%)=  35.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       7.76          3.33
    Dep. Storage     (mm)=       2.00          5.00
    Average Slope     (%)=       1.00          2.00
    Length            (m)=     271.91        180.00
    Mannings n           =      0.013         0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
```

0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)=	50.21	7.47		
over (min)	6.00	56.00		
Storage Coeff. (min)=	6.13 (ii)	55.26 (ii)		
Unit Hyd. Tpeak (min)=	6.00	56.00		
Unit Hyd. peak (cms)=	0.18	0.02		
			TOTALS	
PEAK FLOW (cms)=	0.42	0.04	0.423 (iii)	
TIME TO PEAK (hrs)=	1.53	2.57	1.53	
RUNOFF VOLUME (mm)=	23.00	4.94	11.26	
TOTAL RAINFALL (mm)=	25.00	25.00	25.00	
RUNOFF COEFFICIENT =	0.92	0.20	0.45	

(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 (0201)	Area (ha)=	4.44
ID= 1 DT= 2.0 min	Total Imp(%)=	69.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.06	1.38
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	172.05	170.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 2.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

			TOTALS
Max.Eff.Inten.(mm/hr)=	50.21	6.99	
over (min)	5.00	54.00	
Storage Coeff. (min)=	4.66 (ii)	53.40 (ii)	
Unit Hyd. Tpeak (min)=	4.00	54.00	
Unit Hyd. peak (cms)=	0.25	0.02	
PEAK FLOW (cms)=	0.19	0.01	0.191 (iii)
TIME TO PEAK (hrs)=	1.50	2.53	1.50
RUNOFF VOLUME (mm)=	23.00	4.79	11.15
TOTAL RAINFALL (mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT =	0.92	0.19	0.45

(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 (0006)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0201):	4.44	0.191	1.50	11.15
+ ID2= 2 (0202):	11.09	0.423	1.53	11.26
	15.53	0.614	1.50	11.22

```
        ID = 3 (  0006):    15.53   0.607     1.50    11.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0017):     8.68   0.365     1.53     8.17
      + ID2= 2 (  0207):     1.35   0.082     1.50    11.60
        ================================================
        ID = 3 (  0018):    10.03   0.082     1.50     1.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0018)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0018):    10.03   0.082     1.50     1.56
      + ID2= 2 (  0208):     2.30   0.024     1.57     3.25
        ================================================
        ID = 1 (  0018):    12.33   0.100     1.50     1.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0018):    12.33   0.100     1.50     1.88
      + ID2= 2 (  0006):    15.53   0.607     1.50    11.23
        ================================================
        ID = 3 (  0018):    27.86   0.707     1.50     7.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.8460      1.2694
                         0.0020     0.0418    |   1.1050      1.4542
                         0.0130     0.1284    |   1.3760      1.7075
                         0.0230     0.2663    |   1.5470      1.9027
                         0.0340     0.5192    |   2.0070      1.9688
                         0.1240     0.5741    |   2.8220      2.0353
                         0.1600     0.7981    |   3.8860      2.1024
                         0.2350     0.9712    |   6.6480      2.2381
                         0.2720     1.0299    |   8.3180      2.3067
                         0.6110     1.1487    |  12.2030      2.4574

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)     27.860      0.707      1.50       7.09
   OUTFLOW: ID= 1 (  0500)     27.860      0.016      5.13       4.58

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.31
                  TIME SHIFT OF PEAK FLOW         (min)=218.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1739
```

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

--------------------
| ADD HYD  (  0019)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
        ID1= 1 (  0209):      0.81    0.008      1.50      1.98
      + ID2= 2 (  0500):     27.86    0.016      5.13      4.58
        ================================================
        ID = 3 (  0019):     28.67    0.017      4.00      4.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
*****************************************
** SIMULATION:Post-Dev-PF 100yr 24hr SCS **
*****************************************
--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.8460      1.2694
                          0.0020     0.0418    |   1.1050      1.4542
                          0.0130     0.1284    |   1.3760      1.7075
                          0.0230     0.2663    |   1.5470      1.9027
                          0.0340     0.5192    |   2.0070      1.9688
                          0.1240     0.5741    |   2.8220      2.0353
                          0.1600     0.7981    |   3.8860      2.1024
                          0.2350     0.9712    |   6.6480      2.2381
                          0.2720     1.0299    |   8.3180      2.3067
                          0.6110     1.1487    |  12.2030      2.4574

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)     42.830      7.851     12.10      80.41
   OUTFLOW: ID= 1 (  0500)     42.830      1.429     12.97      75.77

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.21
                  TIME SHIFT OF PEAK FLOW         (min)= 52.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.7685

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:Post-Dev-PF 100yr 4hr CHI **
*****************************************
--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.8460      1.2694
                          0.0020     0.0418    |   1.1050      1.4542
                          0.0130     0.1284    |   1.3760      1.7075
                          0.0230     0.2663    |   1.5470      1.9027
                          0.0340     0.5192    |   2.0070      1.9688
                          0.1240     0.5741    |   2.8220      2.0353
                          0.1600     0.7981    |   3.8860      2.1024
                          0.2350     0.9712    |   6.6480      2.2381
                          0.2720     1.0299    |   8.3180      2.3067
                          0.6110     1.1487    |  12.2030      2.4574

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)     42.830      6.973      1.33      39.47
   OUTFLOW: ID= 1 (  0500)     42.830      0.687      3.17      36.96

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.85
                  TIME SHIFT OF PEAK FLOW         (min)=110.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.1877

--------------------------------------------------------------------------------
*****************************************
** SIMULATION:Post-Dev-PF 10yr 24hr SCS **
*****************************************
--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
```

DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.8460	1.2694
	0.0020	0.0418	1.1050	1.4542
	0.0130	0.1284	1.3760	1.7075
	0.0230	0.2663	1.5470	1.9027
	0.0340	0.5192	2.0070	1.9688
	0.1240	0.5741	2.8220	2.0353
	0.1600	0.7981	3.8860	2.1024
	0.2350	0.9712	6.6480	2.2381
	0.2720	1.0299	8.3180	2.3067
	0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	4.591	12.07	48.64
OUTFLOW: ID= 1 (0500)	42.830	0.673	13.23	44.28

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.66
TIME SHIFT OF PEAK FLOW (min)= 70.00
MAXIMUM STORAGE USED (ha.m.)= 1.1806

****
** SIMULATION:Post-Dev-PF 10yr 4hr CHI **
****

RESERVOIR(0500)	IN= 2---> OUT= 1	DT= 2.0 min	OVERFLOW IS OFF	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
			0.0000	0.0000	0.8460	1.2694
			0.0020	0.0418	1.1050	1.4542
			0.0130	0.1284	1.3760	1.7075
			0.0230	0.2663	1.5470	1.9027
			0.0340	0.5192	2.0070	1.9688
			0.1240	0.5741	2.8220	2.0353
			0.1600	0.7981	3.8860	2.1024
			0.2350	0.9712	6.6480	2.2381
			0.2720	1.0299	8.3180	2.3067
			0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	4.441	1.33	23.96
OUTFLOW: ID= 1 (0500)	42.830	0.186	4.13	21.67

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.20
TIME SHIFT OF PEAK FLOW (min)=168.00
MAXIMUM STORAGE USED (ha.m.)= 0.8588

****
** SIMULATION:Post-Dev-PF 25yr 24hr SCS **
****

RESERVOIR(0500)	IN= 2---> OUT= 1	DT= 2.0 min	OVERFLOW IS OFF	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
			0.0000	0.0000	0.8460	1.2694
			0.0020	0.0418	1.1050	1.4542
			0.0130	0.1284	1.3760	1.7075
			0.0230	0.2663	1.5470	1.9027

0.0340	0.5192	2.0070	1.9688
0.1240	0.5741	2.8220	2.0353
0.1600	0.7981	3.8860	2.1024
0.2350	0.9712	6.6480	2.2381
0.2720	1.0299	8.3180	2.3067
0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	5.841	12.07	61.36
OUTFLOW: ID= 1 (0500)	42.830	1.024	13.07	56.86

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.54
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 1.3967

****
** SIMULATION:Post-Dev-PF 25yr 4hr CHI **
****

RESERVOIR(0500)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.8460	1.2694
	0.0020	0.0418	1.1050	1.4542
	0.0130	0.1284	1.3760	1.7075
	0.0230	0.2663	1.5470	1.9027
	0.0340	0.5192	2.0070	1.9688
	0.1240	0.5741	2.8220	2.0353
	0.1600	0.7981	3.8860	2.1024
	0.2350	0.9712	6.6480	2.2381
	0.2720	1.0299	8.3180	2.3067
	0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	5.437	1.33	29.98
OUTFLOW: ID= 1 (0500)	42.830	0.312	4.07	27.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.75
TIME SHIFT OF PEAK FLOW (min)=164.00
MAXIMUM STORAGE USED (ha.m.)= 1.0442

****
** SIMULATION:Post-Dev-PF 2yr 24hr SCS **
****

RESERVOIR(0500)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.8460	1.2694
	0.0020	0.0418	1.1050	1.4542
	0.0130	0.1284	1.3760	1.7075
	0.0230	0.2663	1.5470	1.9027
	0.0340	0.5192	2.0070	1.9688
	0.1240	0.5741	2.8220	2.0353
	0.1600	0.7981	3.8860	2.1024
	0.2350	0.9712	6.6480	2.2381
	0.2720	1.0299	8.3180	2.3067
	0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	2.505	12.07	26.94
OUTFLOW: ID= 1 (0500)	42.830	0.151	14.63	23.21

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.04
TIME SHIFT OF PEAK FLOW (min)=154.00
MAXIMUM STORAGE USED (ha.m.)= 0.7436

****
** SIMULATION:Post-Dev-PF 2yr 4hr CHI **
****

RESERVOIR(0500) IN= 2---> OUT= 1 DT= 2.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.8460	1.2694
	0.0020	0.0418	1.1050	1.4542
	0.0130	0.1284	1.3760	1.7075
	0.0230	0.2663	1.5470	1.9027
	0.0340	0.5192	2.0070	1.9688
	0.1240	0.5741	2.8220	2.0353
	0.1600	0.7981	3.8860	2.1024
	0.2350	0.9712	6.6480	2.2381
	0.2720	1.0299	8.3180	2.3067
	0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	2.661	1.37	13.26
OUTFLOW: ID= 1 (0500)	42.830	0.038	4.83	11.40

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.41
TIME SHIFT OF PEAK FLOW (min)=208.00
MAXIMUM STORAGE USED (ha.m.)= 0.5214

****
** SIMULATION:Post-Dev-PF 50yr 24hr SCS **
****

RESERVOIR(0500) IN= 2---> OUT= 1 DT= 2.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.8460	1.2694
	0.0020	0.0418	1.1050	1.4542
	0.0130	0.1284	1.3760	1.7075
	0.0230	0.2663	1.5470	1.9027
	0.0340	0.5192	2.0070	1.9688
	0.1240	0.5741	2.8220	2.0353
	0.1600	0.7981	3.8860	2.1024
	0.2350	0.9712	6.6480	2.2381
	0.2720	1.0299	8.3180	2.3067
	0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	6.839	12.07	70.77
OUTFLOW: ID= 1 (0500)	42.830	1.234	13.00	66.20

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.05
TIME SHIFT OF PEAK FLOW (min)= 56.00
MAXIMUM STORAGE USED (ha.m.)= 1.5751

****
** SIMULATION:Post-Dev-PF 50yr 4hr CHI **
****

| RESERVOIR(0500)| IN= 2---> OUT= 1 | DT= 2.0 min | OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8460	1.2694
0.0020	0.0418	1.1050	1.4542
0.0130	0.1284	1.3760	1.7075
0.0230	0.2663	1.5470	1.9027
0.0340	0.5192	2.0070	1.9688
0.1240	0.5741	2.8220	2.0353
0.1600	0.7981	3.8860	2.1024
0.2350	0.9712	6.6480	2.2381
0.2720	1.0299	8.3180	2.3067
0.6110	1.1487	12.2030	2.4574

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2	(0018)	42.830	6.192	1.33	34.57
OUTFLOW: ID= 1	(0500)	42.830	0.509	3.53	32.07

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.23
TIME SHIFT OF PEAK FLOW (min)=132.00
MAXIMUM STORAGE USED (ha.m.)= 1.1131

****
** SIMULATION:Post-Dev-PF 5yr 24hr SCS **
****

| RESERVOIR(0500)| IN= 2---> OUT= 1 | DT= 2.0 min | OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8460	1.2694
0.0020	0.0418	1.1050	1.4542
0.0130	0.1284	1.3760	1.7075
0.0230	0.2663	1.5470	1.9027
0.0340	0.5192	2.0070	1.9688
0.1240	0.5741	2.8220	2.0353
0.1600	0.7981	3.8860	2.1024
0.2350	0.9712	6.6480	2.2381
0.2720	1.0299	8.3180	2.3067
0.6110	1.1487	12.2030	2.4574

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2	(0018)	42.830	3.739	12.07	39.96
OUTFLOW: ID= 1	(0500)	42.830	0.343	13.83	35.71

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.16
TIME SHIFT OF PEAK FLOW (min)=106.00
MAXIMUM STORAGE USED (ha.m.)= 1.0546

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** SIMULATION:Post-Dev-PF 5yr 4hr CHI **
****************************************
--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.8460      1.2694
                          0.0020     0.0418    |   1.1050      1.4542
                          0.0130     0.1284    |   1.3760      1.7075
                          0.0230     0.2663    |   1.5470      1.9027
                          0.0340     0.5192    |   2.0070      1.9688
                          0.1240     0.5741    |   2.8220      2.0353
                          0.1600     0.7981    |   3.8860      2.1024
                          0.2350     0.9712    |   6.6480      2.2381
                          0.2720     1.0299    |   8.3180      2.3067
                          0.6110     1.1487    |  12.2030      2.4574

                                    AREA      QPEAK      TPEAK        R.V.
                                    (ha)      (cms)      (hrs)        (mm)
   INFLOW : ID= 2 (  0018)      42.830       3.707       1.33       19.50
   OUTFLOW: ID= 1 (  0500)      42.830       0.145       4.17       17.39

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.91
                  TIME SHIFT OF PEAK FLOW         (min)=170.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7048

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************************************
** SIMULATION:Post-Dev-PF Timmins **
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--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.8460      1.2694
                          0.0020     0.0418    |   1.1050      1.4542
                          0.0130     0.1284    |   1.3760      1.7075
                          0.0230     0.2663    |   1.5470      1.9027
                          0.0340     0.5192    |   2.0070      1.9688
                          0.1240     0.5741    |   2.8220      2.0353
                          0.1600     0.7981    |   3.8860      2.1024
                          0.2350     0.9712    |   6.6480      2.2381
                          0.2720     1.0299    |   8.3180      2.3067
                          0.6110     1.1487    |  12.2030      2.4574

                                    AREA      QPEAK      TPEAK        R.V.
                                    (ha)      (cms)      (hrs)        (mm)
   INFLOW : ID= 2 (  0018)      42.830       3.604       7.00      134.15
   OUTFLOW: ID= 1 (  0500)      42.830       2.302       7.67      130.62

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 63.87
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.9929

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********************************
** SIMULATION:Post-Dev-PF WQE **
********************************
--------------------
| RESERVOIR(  0500)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
```

----------	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.8460	1.2694
	0.0020	0.0418	1.1050	1.4542
	0.0130	0.1284	1.3760	1.7075
	0.0230	0.2663	1.5470	1.9027
	0.0340	0.5192	2.0070	1.9688
	0.1240	0.5741	2.8220	2.0353
	0.1600	0.7981	3.8860	2.1024
	0.2350	0.9712	6.6480	2.2381
	0.2720	1.0299	8.3180	2.3067
	0.6110	1.1487	12.2030	2.4574

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	42.830	1.349	1.50	8.44
OUTFLOW: ID= 1 (0500)	42.830	0.026	5.20	7.28

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.89
TIME SHIFT OF PEAK FLOW (min)=222.00
MAXIMUM STORAGE USED (ha.m.)= 0.3239

Appendix D

Fire Suppression System Sizing and Cost Estimate

- Fire Suppression Storage Requirements (Design Notes)
- Fire Suppression System Works Cost Estimate

Fire Suppression Storage Volume Requirements
Design Notes

CLIENT: DELTINI Commercial Developments Inc.

DATE: July 2024

PROJECT: 636040 Prince of Wales Road

DESIGN: KR

FILE: FRE-17110 (50)

CHECKED: MF

Site Characteristics

Source & Notes:

Land Use	Light Industrial	*MOE Design Guidelines for Drinking Water Systems 3.4.4, 2008*
Water Demand	35	**m^3/ha/day**
Largest Block On Site	1.88	**ha**

Population

Notes:

Typical Maximum Water Demand is 270 L / person / day

Specific Demand *(Water Demand * Block Area)*	65800	**L/day**
Population *(Specific Demand ÷ Typical Max. Demand)*	244	**People**

Fire Flow Storage

Total Treated Water Storage Requirement = A + B + C

Source & Notes:

Calculation for Total Treated Water Storage Requirement taken from MOE Design Guidelines for Drinking Water Systems 8.4.2, 2008

Suggested Flow	38	**L/s**
Duration Required	2	**Hrs**
Fire Storage Volume (A)	273600	**L**
Equalization Storage (B) *(25% of max. day demand)*	0	**L**
Emergency Storage (C) *(25% of A + B)*	68400	**L**
Total Water Storage Required	**342000**	**L**

Equalization Storage not applicable to design as the required volume does not include potable water

Equiv. Population	Suggested Fire Flow (L/s)	Duration (Hrs)
500-1000	38	2
1000	64	2
1500	79	2
2000	95	2
3000	110	2
4000	125	2
5000	144	2
6000	159	3
10000	189	3
13000	220	3
17000	250	4
27000	318	5
33000	348	5
40000	378	6

Excerpt - MOE Table 8-1, 2008

Prince of Wales Rd / HWY 89 Industrial Park

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

Fire Supression System Works Cost Estimate

TJCG Project No. FRE-17110

Date: July 2024

ITEM	UNIT	EST. QUANT.	UNIT PRICE	TOTAL AMOUNT	NOTES
342 cu.m Water Storage Tower	LS	1	$2,000,000.00	$2,000,000.00	
300mm diameter PVC watermain c/w tees, bends, crosses and appurtenances	m	475	$450.00	$213,750.00	
Fire hydrant, tee and valve	ea.	5	$6,000.00	$30,000.00	
300mm diameter valves	each	1	$450.00	$450.00	
Drilled Well to Supply Fire Flow	m	12	$500.00	$6,000.00	*- Estimated depth of water supply well based on the shallowest water-bearing formation noted in the Preliminary Hydrogeological and Servicing Concepts Study prepared by Azimuth Environmental Consulting, INC. Dated. March 2009*

Total: $2,250,200.00

Notes:

Costs include the supply and installation of the fire suppression system works