

**STORMWATER MANAGEMENT DESIGN BRIEF**  
**REACH STREET LANDS**  
**VENETIAN GROUP LTD.**  
**TOWNSHIP OF UXBRIDGE**

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**Project No.:** 17:386

**Date:** March, 2021, Revised July 2021, Revised October 2021

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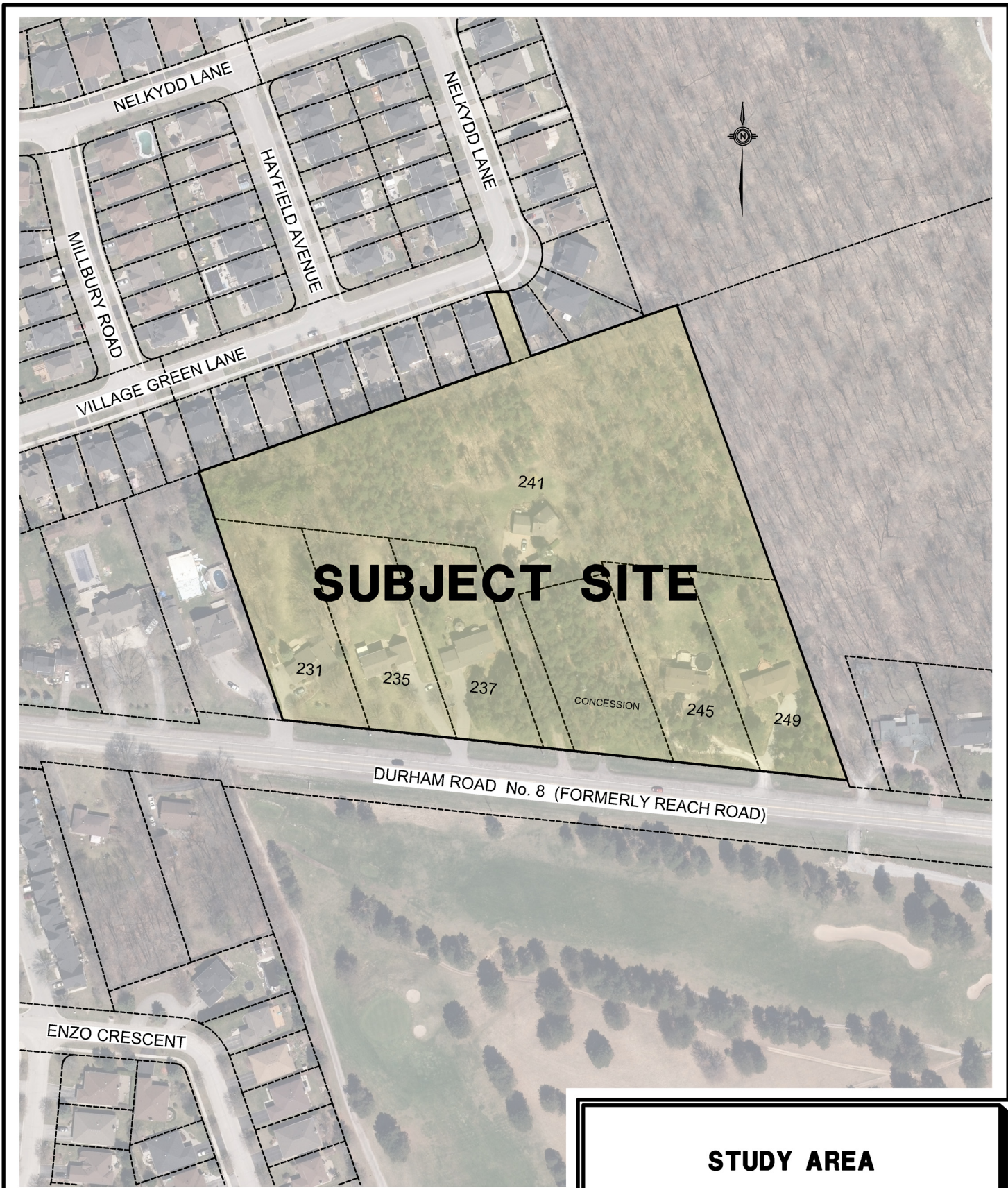
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## 1. INTRODUCTION

Sabourin Kimble & Associates Ltd. have been retained by Venetian Group Ltd. to complete a detailed Stormwater Management Design Brief in support of the detailed design for redevelopment of the lands at 231 to 249 Reach Street in the Township of Uxbridge. The Study Area is located on the north side of Reach Street just east of Coral Creek Crescent/Testa Road, as shown in Figure 1.0.

The purpose of this report is to provide municipal servicing and stormwater management information to address site storm drainage conveyance and capture and stormwater management for the proposed development.



# SUBJECT SITE

## STUDY AREA



**SABOURIN KIMBLE  
& ASSOCIATES LTD.**  
CONSULTING ENGINEERS

PROJECT NUMBER  
**17:386**

FIGURE NO.  
**1**



## 2. MUNICIPAL SERVICES

### 2.1 Site Grading

As shown in drawings SG-1 through SG-3 specific grading is required to support the development concept. The interior roads have been graded to collect overland flow at a low point adjacent to the proposed woodlot at the northwest limit of the site. The capacity of the downstream storm drainage system has specific flow targets for this site and as such, it is proposed to capture all overland flows within the site and convey them to the outlet via the storm sewer system. Prior to discharge to the downstream receiving storm sewer, the flows will be controlled on-site to the required targets. Further details with respect to on-site overland flow capture and associated stormwater management controls are provided in the following sections of this report.

### 2.2 Storm Drainage

The storm sewer design for the Estates of Avonlea subdivision to the north, made allowance for external uncontrolled flow (reaching the northwest limit of the Study Area) of approximately 0.38 hectares at a runoff coefficient of 0.35. This flow was anticipated to discharge via a rear yard catchbasin from Lot 30 to the Village Green Lane storm sewer. This downstream development has also sized the municipal storm sewers and communal Stormwater Management Pond to accommodate the site using a runoff coefficient of 0.45 and an overall area of 1.65 ha. A servicing block at the northeast corner of the Study Area connects to Village Green Lane. The allowable storm discharge from the site was identified as 221 l/s and 414 l/s for the 5-year and 100-year storms respectively as shown on the Avonlea Estates storm drainage boundary plans (Appendix A). Therefore, adequate stormwater management controls must be implemented on the Study Area to meet the downstream capacity constraints. The details of those controls are outlined in the following sections.

As shown in drawings SS-1 through SS-3 the entire site will be serviced by a storm sewer system which outlets to the existing 525mm diameter storm sewer on Nelkydd Lane. The internal storm sewers have been sized to convey the 5-year and 100-year storm flows to the outlet of the site. A runoff coefficient of 0.75 for the multi-family residential portion of the site, 0.85 for direct roof connections and 0.25 for the remaining open space plus the external drainage area was applied as per the Township of Uxbridge design criteria. The site storm drainage will be controlled to a

maximum flow of 221 l/s for the 5-year storm and 414 l/s for the 100-year storm as per the requirements of the downstream storm drainage system. Details of the stormwater management controls are provided in Section 4.0 of this report.

Overland drainage from the rear yards adjacent to the existing subdivision and the existing woodlot at the northwest corner will outlet to the existing rear yard catchbasin within the downstream subdivision. The combined coverage and drainage area is equal to that anticipated in the Village Green Lane design as outlined in the supporting design calculations (Appendix B).

A storm sewer design sheet and storm drainage plan have also been provided in Appendix C.

### 3. STORMWATER MANAGEMENT

#### 3.1 Stormwater Management Criteria

The stormwater management approach for the site must meet the overall stormwater management criteria as established in the LSRCA Technical Guidelines for Stormwater Management Submissions (2016), the requirements of the Township of Uxbridge as summarized and the Stormwater Management Master Plan – Uxbridge Urban Area and Hamlet of Coppin’s Corners (May 2016) in Table 1.

<b>TABLE 1</b>	
<b><u>OVERALL STORMWATER MANAGEMENT CRITERIA</u></b>	
<b>Control</b>	<b>Criteria</b>
Water Quality	<ul style="list-style-type: none"> <li>• Enhanced fisheries protection as outlined in the MOE Stormwater Management Practices Planning and Design Manual.</li> <li>• Removal of 80% of the annual Total Phosphorus load from the entire development as outlined in the LSRCA Technical Guidelines for Stormwater Management Submission (September 2016). Plus, “zero export target” must be achieved as per LSRCA’s Phosphorus Offsetting Policy (May 2019).</li> </ul>
Erosion Control	<ul style="list-style-type: none"> <li>• As outlined in the Stormwater Management Master Plan – Uxbridge Urban Area and Hamlet of Coppin’s Corners (May 2016), the extended detention of the 40mm storm runoff for a minimum of 24 hours.</li> </ul>
Water Quantity	<ul style="list-style-type: none"> <li>• Control post development flows to pre-development levels for the 2 through 100-year storms.</li> <li>• As per the downstream subdivision design, control the site discharge to the downstream storm sewer to 221 l/sec for the 5-year design storm and 441 l/sec for the 100-year design storm.</li> <li>• Maintain or reduce the equivalent discharge to the rear yard catchbasin at existing lot 30 (downstream subdivision) to the area and coverage provided in the storm sewer design.</li> <li>• Control stormwater runoff volumes such that, the post-construction runoff volume shall be retained on site from runoff of the first 25 mm of rainfall from all impervious surfaces on the site.</li> <li>• Maintain safe conveyance of flows to sufficient outlets without negative impacts on adjacent properties.</li> </ul>
Water Budget	<ul style="list-style-type: none"> <li>• Maintain the pre-development water balance under post development conditions.</li> </ul>



### 3.2 Stormwater Management Concept

The stormwater management approach has been developed to reflect the Stormwater Management Guidelines outlined in Table 1 and the infiltration capacity of the site. The on-site soils are predominately sand with high infiltration capabilities (refer to section 3.3). Therefore, it is proposed to infiltrate a volume equivalent to the 40mm storm runoff from all impervious surfaces. It is proposed that these works will adequately address the overall stormwater management criteria for water quality control, erosion control and the runoff volume control as outlined in Table 1. Additional water quantity storage will be provided to adequately address the limited capacity of the downstream receiving system. The entire system has also been reviewed by Palmer Environmental as it relates to site water balance and phosphorous loading (a summary of that assessment is provided in section 3.6).

Open bottom sub-surface storage, perforated storm sewers, and rear yard pervious catchbasins will provide the required on-site infiltration/retention volume as shown in drawings SS-1 through SS-3. Specific and distinct infiltration systems will be provided throughout the site as shown in Figure 2 – LID Drainage (back pocket). When the infiltration capacity is reached, rear yard LID areas 1, 2, 4, 5 and 6 will overflow into the perforated storm sewer system for additional controls. Rear yard LID area 3 will outlet to the existing woodlot when the infiltration capacity is reached. The internal perforated pipe system and open-bottom storage facilities are completely linked and dendritic in nature to provide adequate infiltration capacity for the remainder of the site. The infiltration capabilities of the granular cisterns will be supplemented by extra depth topsoil (0.3 m minimum) on all lawn and landscaped areas. Roadway catchbasins have been strategically located to maximize contributions from rooftops and rear yard/landscape areas. All road drainage will be pre-treated through an oil/grit separator prior to discharge to any infiltration facilities.

Flows in excess of the 40mm runoff event up to the 100-year storm event will be controlled for water quantity purposes by orifice plates located at the downstream end of the storm sewer system, in MH24. The water quantity storage volume will be provided via pipe storage within the storm sewer system and three open bottom underground ADS storage chamber systems situated at strategic locations within the site.

Allowable release rates, post development flows and runoff volumes have been evaluated at the site outlet. The technical details of the proposed stormwater management system are provided in the following sections.

### **3.3 Supporting Study**

In March 2019, Palmer Environmental Consulting Group Inc. completed a detailed hydrogeologic investigation on the site which included six (6) boreholes with three (3) monitoring wells. Boreholes were drilled to depths of up to 8.0 metres. Through the monitoring period the boreholes and monitoring wells remained dry. As a result, the monitoring was expanded to include five (5) existing private wells located within the site boundary. Monitoring of these wells concluded that the ground water levels were between 10 and 15 metres below existing ground elevations. The monitoring is on-going and will be updated as the development process proceeds. These ground water elevations were monitored over the course of one (1) year and were considered to be stable with very little fluctuation. The report identified that seasonal variations of 0.2-0.4 metres may be expected.

A representative percolation rate was determined empirically based on the geometric mean of hydraulic conductivity valuations for two (2) locations within the site. The empirical calculation was supported by field testing utilizing the Guelph Permeameter in five (5) different test locations. The resulting representative infiltration rate was determined to be 72 mm/hr and was subject to a safety factor of 2.5. Therefore, a percolation rate of 28.8 mm/hr was utilized in the design of the LID system.

A detailed summary of the hydrogeologic investigation and findings is provided in the Palmer report provided under separate cover.

### **3.4 Stormwater Quality/LID Controls**

Water quality and infiltration facilities have been distributed throughout the site as shown in Figure 2 (back pocket) to retain the runoff from a 40mm storm event on site, meeting the 40mm erosion requirement set out by the Uxbridge SWM Master Plan. Runoff from 50% of the roof area within rear yard LID areas 1 through 5 will be directed to the surface at the rear of each housing unit. This runoff will combine with overland flow from the rear yards and discharge to swales located

along rear property line. The flow from the swales will be captured by pervious rear yard catchbasins that discharge into a granular trench located beneath the swale. The granular trenches have been designed with sufficient storage volume to accommodate the equivalent of 40mm of runoff from the contributing roof areas. Sufficient contact area has been provided to accommodate draindown of the storage volume within a 24-48 hour period. An overflow outlet will be provided on each granular gallery should they become full. Rear yard LID areas 1, 2, 4, 5 and 6 will overflow into the storm sewer system within the road for further water quantity control. Rear yard LID area 3 will overflow into the woodlot located at the northwest limit of the site. A detail of the rear yard LID system is provided in drawing Figure 2 (back pocket).

The remainder of the site will contribute runoff to the internal perforated storm sewers and open bottom storage facilities with sufficient granular storage capacity to accommodate 40mm of runoff from the remaining roof areas and all of the surface impervious areas (roadways and driveways). These infiltration facilities are proposed in a dendritic fashion following the storm sewer routing such that continuous storage volume is always available. It is proposed that the remaining front roof areas (50%) of the units adjacent to rear yard LID's in addition to 100% of the remaining roof areas be directly connected to the perforated storm sewer system. Road drainage will be captured via conventional catchbasins, and pre-treatment will be provided via strategically located oil/grit separators (OGS). The granular galleries under the roadway have been designed with sufficient contact area to ensure a draindown time of a 24-48 hours per MOE Guidelines. There are four (4) open bottom facilities each with a draindown time of 45 hours. See Figure 2 (back pocket) for all LID details.

The contributing drainage areas and corresponding storage volumes are summarized in Table 2.

<b>TABLE 2</b>				
<b>ON-SITE WATER QUALITY/INFILTRATION VOLUMES</b>				
<b>Drainage Area</b>	<b>Total Contributing Drainage Area (ha)</b>	<b>Total Impervious Area (ha)</b>	<b>Required Storage Volume (m<sup>3</sup>)</b>	<b>Storage Volume Provided (m<sup>3</sup>)</b>
Rear Yard LID*	0.98	0.74	294	310
Perforated Storm Sewer	1.38	1.10	438	197
Open Bottom Storm Chambers	0.28	0.20	85	363
<b>Total</b>	<b>2.64</b>	<b>2.04</b>	<b>817</b>	<b>870</b>

\*External area contributing to the LID but not included in the calculation is 1.0 ha from outside of subject property and External area contributing to the LID but not included in the calculation is 0.83 ha of woodlot from within Study Area and 0.44 ha from outside of the Study Area.

Calculations in support of the water quality/infiltration design are enclosed in Appendix D.

### 3.5 Stormwater Quantity Controls

All erosion control requirements for the site are addressed by infiltration of the 40mm storm event. Any flows in excess of the 40mm event will be captured internal to the site and controlled by water quantity control orifice plates located in MH24. The surface flow capture analysis is summarized in section 3.7.

The extended rational method was utilized to determine the storage volume required to meet the downstream flow requirements. Stacked 219mm and 371mm diameter orifice plates are proposed to control the discharge from the developed area such that post development flows meet the 5-year storm flow target of 221 l/s and the 100-year storm flow target of 414 l/s. These orifice plate controls result in a maximum 100-year storm storage volume of 705 cubic metres at a maximum ponding elevation of 279.30 metres. The storage volume will be provided within the storm sewers and in the open bottom storage systems located within the site. The resultant storage volume and ponding elevations for each return period storm are summarized in Table 3.

<b>Storm</b>	<b>Maximum Water Surface Elevation (m)</b>	<b>Peak Discharge Rate (m<sup>3</sup>/s)</b>	<b>Maximum Allowable Discharge Rate (m<sup>3</sup>/s)</b>	<b>Storage Volume in Storm Sewer System (m<sup>3</sup>)</b>	<b>Storage Volume in ADS Storm Chamber System (m<sup>3</sup>)</b>	<b>Total Storage Volume (m<sup>3</sup>)</b>
5-year	278.24	0.085	0.221	23	219	242
100-year	279.30	0.414	0.414	84	621	705

Calculations in support of the water quantity control system are enclosed in Appendix E.

### 3.6 Confirmation of Existing Stormwater Management Pond Operation

The post development hydrologic model for the Estates of Avonlea subdivision was utilized to confirm that the quantity controls provided on the site would not adversely impact the operation of the downstream stormwater management facility. The Study Area and associated storage characteristics as summarized in the previous sections were inserted into the hydrologic model for the Avonlea SWM facility and the results of that evaluation are summarized in Table 4.

<b>Storm Event</b>	<b>Required Volume (m<sup>3</sup>)</b>	<b>Target Peak Flow (m<sup>3</sup>/s)</b>	<b>Resultant Volume (m<sup>3</sup>)</b>	<b>Resultant Peak Flow (m<sup>3</sup>/s)</b>
<b>5-year</b>	3,757	0.16	3,679	0.14
<b>25-year</b>	4,946	0.50	4,914	0.48
<b>50 Year</b>	5,416	0.67	5,404	0.66
<b>100-year</b>	5,912	0.86	5,925	0.85

As shown in Table 4, the proposed development does not adversely impact the operation of the existing Estates of Avonlea stormwater management. Details of the Estates of Avonlea stormwater management pond review are provided in Appendix B.

### **3.7 Surface Flow Capture Assessment**

An OTTSWMM model was utilized to determine the infrastructure required to safely capture the 100-year flow from the site into the minor system. This assessment examined the runoff generated from the site, the ability of the roadways to pass the overland flow and the capture capacity of the catchbasins. All localized low points were modeled to ensure that any surface ponding does not impact any residential units.

A complete summary of the OTTSWMM analysis is provided in Appendix F; Figure 3 – OTTSWMM Plan; and input and output files.



### 3.8 Water Balance and Phosphorus Assessment

Palmer Environmental Consulting Group completed a detailed assessment of water budget and phosphorus generation for the site under existing and proposed conditions. Each assessment evaluated the effectiveness of the proposed LID's in maintaining water balance for the site and reducing phosphorus generation.

The pre-development and post development water budget was completed for the overall study area using a monthly soil-moisture balance approach (Thorntwaite and Mather, 1957). The water balance calculations estimate average annual evapotranspiration (evaporation and plant transpiration) using factors such as monthly precipitation, temperature and latitude. The average available water surplus, which is the water available for infiltration and runoff purposes, was calculated by subtracting the average annual evapotranspiration from the average annual precipitation. Based on soil conditions at the site, a soil moisture retention value of 150 mm was utilized to represent the soil type and vegetation cover. The resulting annual water surplus was then partitioned using infiltration coefficients based on MOEE (1995) and modified based on site specific conditions. This approach takes into consideration three factors: topography/slope, soil type, and land cover, which are summed to provide a representative infiltration factor for the area.

The pre-development water budget resulted in total runoff of 3,087 m<sup>3</sup>/yr and total infiltration of 10,451m<sup>3</sup>/yr. Under post development conditions, the provision of the proposed LID works results in total runoff of 3,891 m<sup>3</sup>/yr and total infiltration of 19,203 m<sup>3</sup>/yr. The provision of the distributed LID works throughout the site result in a slight increase in site runoff and a net increase in infiltration of approximately 84%.

The Lake Simcoe Phosphorus Offsetting Program (LSPOP) requires that all new developments must control 100% of the phosphorus from leaving their property. Based on the Lake Simcoe Region Conservation Authority (LSRCA) Phosphorus Offsetting Policy and the MECP Phosphorus Budget Tool (V2.0 Release Update – March 30, 2012) PECG estimated the pre- and post-development phosphorous budget for the site.

Based on the existing cover for the site, the pre-development phosphorus load was calculated to be 0.35 kg/yr and the estimated annual loading will increase by 3.12 kg/year as a result of the proposed development. Palmer evaluated the effectiveness of the proposed distributed infiltration

works for the site and determined that the combined post-development phosphorus load including the construction phase loading is therefore 0.21 kg/year. As the LSRCA's "zero export target", is not met, phosphorus offsetting will be provided to the LSRCA.

Detailed calculations regarding the phosphorus offsetting policy can be found in Palmer Environmental Consulting Group Inc.'s Hydrogeological report in Section 3.5.

#### 4. EROSION AND SEDIMENTATION CONTROL MEASURES

During construction of any portion of the subject lands adequate erosion and sediment controls must be implemented to safeguard them against potential impacts. In support of the detailed design for this development proposal, a comprehensive construction erosion and sedimentation control plan has been prepared. This plan includes the provision of the following works as outlined in the Pre-Servicing ESC Plan (ESC-1), Post-Servicing ESC Plan (ESC-2) and Erosion Sedimentation Control Details (ESC-3):

- Sediment control fencing around the perimeter of the site including double sediment fence with an intermediate straw bale installation adjacent to all existing sensitive features,
- Construction mud mat at the designated entrance to the site,
- Silt sacks on all road catchbasins,
- Sediment traps adjacent to the northwest woodlot to detain runoff and provide an opportunity for the sediment to settle out,
- Catchbasin sediment traps on all rear yard catchbasins,
- Rock Check Dams internal to the site in order to slow runoff in the interceptor swales.
- Rock Check Dams external to the site to prevent sediment from draining along the adjacent Reach Street ditch towards existing residential properties.
- Removal of all topsoil from the site for the duration of underground and house construction,
- Strategic review protocol for all sediment control works during the construction period.

Sediment control practices will be implemented for all construction activities within the Study Area, including tree removal, topsoil stripping, underground sewer construction, road construction and house construction. Sediment control measures are to be installed and operational prior to any construction activity and are to remain in place until such time as the residential dwellings are constructed and the lot grading complete with established sod.

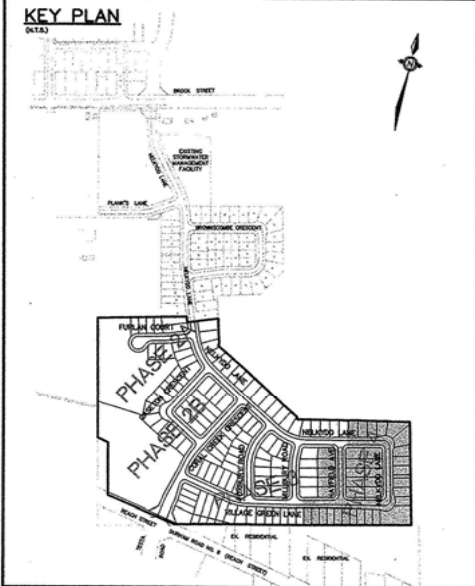
Calculations for the sediment trap sizing can be found Appendix G.

## 5. CONCLUSIONS

Based on the findings of this Stormwater Management Design Brief, the following conclusions were reached:

- The subject lands should be developed as townhouse residential land use,
- The style of development requires specific grading that may be accommodated on this site,
- The proposed infiltration works provide sufficient capacity to retain and infiltrate the runoff volume from a 40mm design storm over the contributing impervious area,
- The proposed water quantity controls will control post development flows to meet the specific flow targets at the site outlet,
- Appropriate infrastructure has been provided to safely capture and control the 100-year storm flows from the site to the required release rates,
- The on-site stormwater management works are sufficient to ensure that the downstream stormwater management facility located within the Estates of Avonlea subdivision will continue to operate as designed
- The proposed LID program will be effective in maintaining the post development to pre-development water balance and will result in a lower phosphorus generation than under existing conditions.

**APPENDIX A**  
**Existing Avonlea Storm Design**



**ESTATES OF AVONLEA  
PHASE 4**

**LEGEND**

- PROPOSED STORM SERVICE
- 0.35 / 0.45 — DRAINAGE AREA (Ha) / RUNOFF COEFFICIENT
- 0.87 / 0.45 — EXTERNAL DRAINAGE AREA (Ha) / EXTERNAL RUNOFF COEFFICIENT
- ➔ — MAJOR SYSTEM
- ⊙ — UNITS WITH KEEPING TILE SUMP AND SUMP PUMP DISCHARGING TO SPLASHPAD IN SIDEYARD

**ISSUED FOR CONSTRUCTION**

**NOTE:**  
ORIFICE PLATES TO BE INSTALLED ON ALL STREET CATCHBASIN LEADS IN PHASES 2,3 & 4.  
ORIFICE PLATES TO BE SCEPTER TYPE 'A' OR APPROVED EQUAL. REFER TO DETAIL ON DRAWING CD-1.

NO.	REVISION	DATE	BY	APPROVED
4.	PHASE 4 FINAL SUBMISSION	07/09	E.G.	
3.	PHASE 4 THIRD SUBMISSION	06/09	F.W.	
2.	PHASE 4 SECOND SUBMISSION	03/09	F.W.	
1.	PHASE 4 FIRST SUBMISSION	01/09	F.W.	

ACCEPTED TO BE IN GENERAL CONFORMANCE WITH THE TOWNSHIP OF UXBRIDGE STANDARDS. THIS ACCEPTANCE IS NOT TO BE CONSTRUED AS VERIFICATION OF ENGINEERING CONTENT.

*[Signature]*  
DATE: **Aug 11 2009**

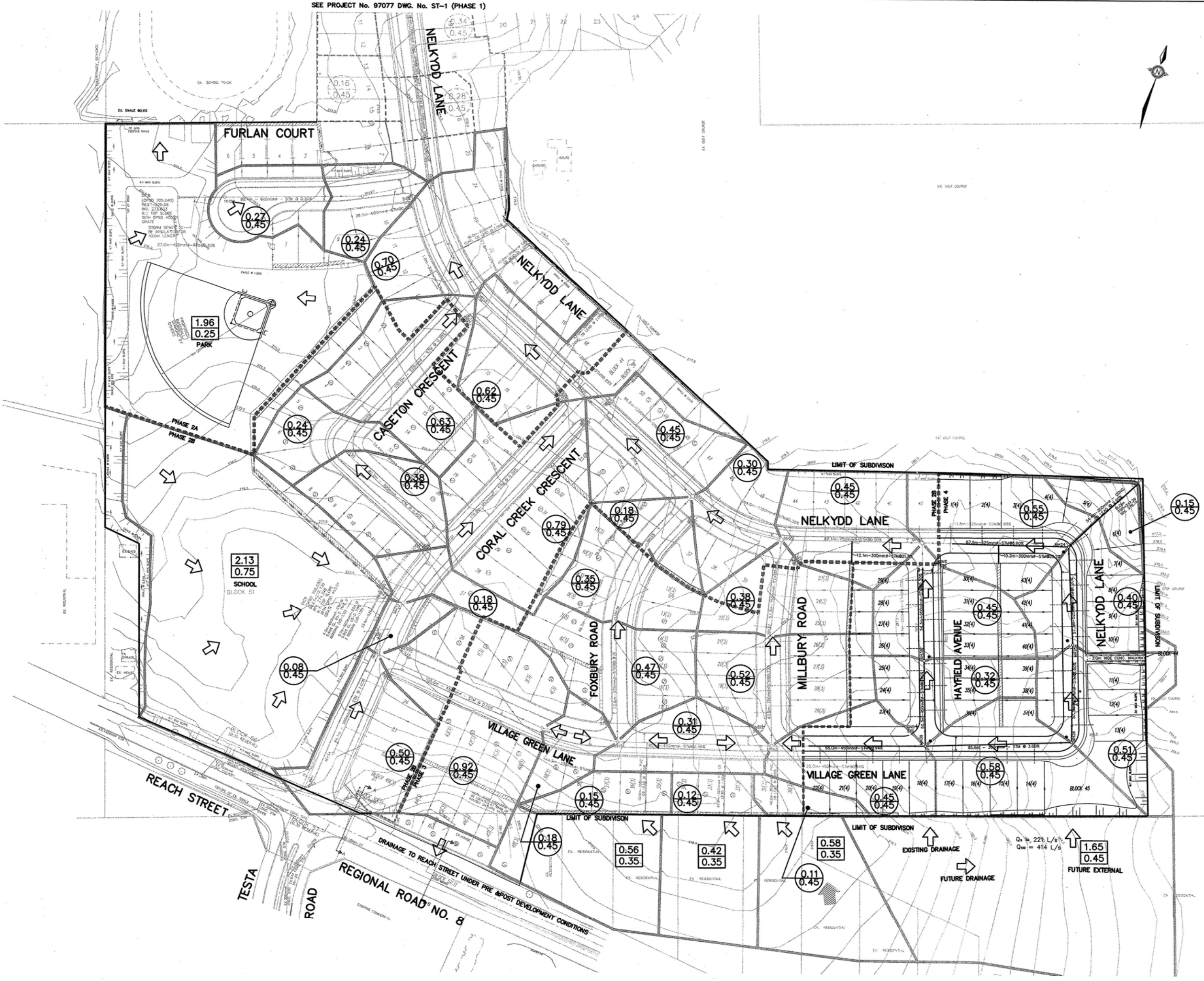
CORPORATION OF THE TOWNSHIP OF UXBRIDGE

**CORAL CREEK HOMES  
STORM DRAINAGE PLAN  
18T-99009**



B.J. Burnside & Associates Limited  
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	SCALE: 1:1000	PROJECT NO. PTB-11727
	DRAWN BY: F.W.	DRAWING NO.
	DESIGNED BY: F.W.	<b>ST-1</b>
	CHECKED BY: E.G.	
	DATE: JUNE 2009	



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**TOWNSHIP OF UXBRIDGE**  
**STORM SEWER DESIGN SHEET - MINOR SYSTEM**  
**CORAL CREEK HOMES - PHASE 4**

CALCULATED BY: F.W.      DATE: JUNE 2009  
 CHECKED BY: E.G.      DATE: JUNE 2009  
 PROJECT NO.: 02-3956      SHEET 1 OF 3

STREET	UP STREAM		DOWN STREAM		SECTION			CUMULATIVE	INTENSITY	FLOW	PIPE					CONC.	TOTAL
	MH	INVERT	MH	INVERT	AREA	COEFF.	AxR	AxR	I <sub>s</sub>	Q <sub>s</sub>	LENGTH	SIZE	GRADE	CAP.	VEL.	TIME	TIME
					(ha)				(mm/s)	(l/s)	(m)	(mm)	(%)	(l/s)	(m/s)	(min.)	(min.)
																	10.00
* Nelkydd Lane	FUT	279.19	26	277.320	1.65	0.45	0.743	0.743	107.01	221	196.7	525	0.40	284	1.27	2.58	12.58
Nelkydd Lane	26	277.290	25	276.430	0.51	0.45	0.230	0.972	94.42	255	57.3	525	1.50	549	2.46	0.39	12.97
Nelkydd Lane	25	276.400	24	275.710	0.40	0.45	0.180	1.152	92.81	297	57.3	525	1.20	491	2.20	0.43	13.40
																	10.00
	RLCB4	276.120	24	275.850	0.15	0.45	0.068	0.068	107.01	20	54.4	300	0.50	71	0.98	0.93	10.93
Nelkydd Lane	24	275.620	23	274.854	0.55	0.45	0.248	1.467	91.08	371	85.6	525	0.90	426	1.90	0.75	13.40
																	10.00
Village Green Lane	26	277.920	39	275.350	0.58	0.45	0.261	0.261	107.01	78	85.6	300	3.00	175	2.39	0.60	10.60
Hayfield Avenue	39	275.250	38	274.950	0.32	0.45	0.144	0.405	103.77	117	50.3	450	0.60	230	1.40	0.60	11.19
Hayfield Avenue	38	274.920	23	274.712	0.45	0.45	0.203	0.608	100.74	170	68.7	600	0.30	351	1.20	0.95	12.15
																	13.40
Nelkydd Lane	23	274.562	22	274.151	0.45	0.45	0.203	2.277	91.08	576	82.4	750	0.50	820	1.80	0.76	14.17
																	10.00
					0.15	0.45	0.068	0.068									
	RLCB3		42		0.56	0.35	0.196	0.264	107.01	78	40.0	300	1.00	101	1.38	0.48	10.48
					0.12	0.45	0.054	0.054									
	RLCB2		42		0.42	0.35	0.147	0.201	107.01	60	40.0	300	1.00	101	1.38	0.48	10.48
Village Green Lane	42	275.385	43	274.790	0.31	0.45	0.140	0.604	104.37	175	90.1	450	0.66	242	1.47	1.02	11.50
																	10.00
					0.11	0.45	0.050	0.050									
	RLCB1		43		0.58	0.35	0.203	0.253	107.01	75	40.0	300	1.00	101	1.38	0.48	10.48
Village Green Lane	39	275.710	43	274.863	0.19	0.45	0.086	0.338	104.37	98	90.0	450	0.94	288	1.76	0.85	11.34
Millbury Road	43	274.595	37	274.448	0.52	0.45	0.234	1.176	100.05	327	63.9	750	0.23	557	1.22	0.87	12.37
Millbury Road	37	274.294	22	274.150	0.38	0.45	0.171	1.347	95.31	357	57.3	750	0.25	582	1.28	0.75	13.12
																	14.17
Nelkydd Lane	22	273.807	21	273.630	0.30	0.45	0.135	3.759	88.21	921	59.0	1050	0.30	1560	1.75	0.56	14.73
																	10.00
Foxbury Road	42	275.450	36	274.864	0.47	0.45	0.212	0.212	107.01	63	72.6	375	0.81	164	1.44	0.84	10.84
Foxbury Road	36	274.784	35	274.550	0.35	0.45	0.158	0.369	102.51	105	46.7	375	0.50	129	1.14	0.69	11.52
Foxbury Road	35	274.408	21	274.210	0.18	0.45	0.081	0.450	99.15	124	39.6	450	0.50	210	1.28	0.52	12.04

R = 0.45 (Single Family-Urban) / 0.75 (Townhouses & School)  
 I<sub>s</sub> = 904/(T+5)<sup>0.788</sup>      Rational Formula      Q=2.78AIR

Limit of flow velocity = 0.75m/s < V < 4.5m/s

\* Allowable Peak Flow From 241 Reach Street

**TOWNSHIP OF UXBRIDGE**  
**STORM SEWER DESIGN SHEET - 100-YEAR**  
**CORAL CREEK HOMES - PHASE 4**

CALCULATED BY: F.W.      DATE: JUNE 2009  
 CHECKED BY: E.G.      DATE: JUNE 2009  
 PROJECT NO.: 02-3956      SHEET 1 OF 3

STREET	UP STREAM		DOWN STREAM		SECTION			CUMULATIVE	INTENSITY	FLOW	PIPE					CONC.	TOTAL
	MH	INVERT	MH	INVERT	AREA	COEFF.	AxR	AxR	I <sub>100</sub>	Q <sub>100</sub>	LENGTH	SIZE	GRADE	CAP.	VEL.	TIME	TIME
					(ha)				(mm/s)	(l/s)	(m)	(mm)	(%)	(l/s)	(m/s)	(min.)	(min.)
																	10.00
* Nelkydd Lane	FUT	279.190	26	277.320	1.65	0.56	0.928	0.928	200.63	517	196.7	525	0.40	284	1.27	2.58	12.58
Nelkydd Lane	26	277.290	25	276.430	0.51	0.56	0.287	1.215	176.41	595	57.3	525	1.50	549	2.46	0.39	12.97
Nelkydd Lane	25	276.400	24	275.710	0.40	0.56	0.225	1.440	173.32	693	57.3	525	1.20	491	2.20	0.43	13.40
																	10.00
	RLCB4	276.120	24	275.850	0.15	0.56	0.084	0.084	200.63	47	54.4	300	0.50	71	0.98	0.93	10.93
Nelkydd Lane	24	275.620	23	274.854	0.55	0.56	0.309	1.834	170.00	866	85.6	525	0.90	426	1.90	0.75	13.40
																	10.00
Village Green Lane	26	277.920	39	275.350	0.58	0.56	0.326	0.326	200.63	182	85.6	300	3.00	175	2.39	0.60	10.60
Hayfield Avenue	39	275.250	38	274.950	0.32	0.56	0.180	0.506	194.40	273	50.3	450	0.60	230	1.40	0.60	11.19
Hayfield Avenue	38	274.920	23	274.712	0.45	0.56	0.253	0.759	188.57	398	68.7	600	0.30	351	1.20	0.95	12.15
																	13.40
Nelkydd Lane	23	274.562	22	274.151	0.45	0.45	0.203	2.796	170.00	1320	82.4	750	0.50	820	1.80	0.76	14.17
																	10.00
					0.15	0.45	0.068	0.068									
	RLCB3		42		0.56	0.35	0.196	0.264	200.63	147	40.0	300	1.00	101	1.38	0.48	10.48
					0.12	0.45	0.054	0.054									
	RLCB2		42		0.42	0.35	0.147	0.201	200.63	112	40.0	300	1.00	101	1.38	0.48	10.48
Village Green Lane	42	275.385	43	274.790	0.31	0.45	0.140	0.604	195.55	328	90.1	450	0.66	242	1.47	1.02	11.50
																	10.00
					0.11	0.56	0.062	0.062									
	RLCB1		43		0.58	0.44	0.254	0.316	200.63	176	40.0	300	1.00	101	1.38	0.48	10.48
Village Green Lane	39	275.710	43	274.863	0.19	0.56	0.107	0.423	195.55	230	90.0	450	0.94	288	1.76	0.85	11.34
Millbury Road	43	274.595	37	274.448	0.52	0.45	0.234	1.261	187.23	656	63.9	750	0.23	557	1.22	0.87	12.37
Millbury Road	37	274.294	22	274.150	0.38	0.45	0.171	1.432	178.12	708	57.3	750	0.25	582	1.28	0.75	13.12
																	14.17
Nelkydd Lane	22	273.807	21	273.630	0.30	0.45	0.135	4.362	164.49	1993	59.0	1050	0.30	1560	1.75	0.56	14.73
																	10.00
Foxbury Road	42	275.450	36	274.864	0.47	0.45	0.212	0.212	200.63	118	72.6	375	0.81	164	1.44	0.84	10.84
Foxbury Road	36	274.784	35	274.550	0.35	0.45	0.158	0.369	191.97	197	46.7	375	0.50	129	1.14	0.69	11.52
Foxbury Road	35	274.408	21	274.210	0.18	0.45	0.081	0.450	185.50	232	39.6	450	0.50	210	1.28	0.52	12.04

R = 0.45 (Single Family-Urban) / 0.75 (Townhouses & School)  
 I<sub>100</sub> = 1799/(T+5)<sup>0.810</sup>      Rational Formula      Q=2.78AI<sup>R</sup>

Limit of flow velocity = 0.75m/s < V < 4.5m/s

\*Allowable Peak Flow From 241 Reach Street

## **APPENDIX B**

### **Avonlea Storm Pond Analysis**

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Reach St. Uxbridge

Quantity Control Analysis - External Drainage Conditions

<b>Existing Drainage Conditions to External Lands</b>	<b>Area (Ha)</b>	<b>Runoff Coefficient</b>	<b>AR</b>
Drainage Area to Village Green Lane Accounted For By R.J, Burnside	0.58	0.35	<b>0.203</b>
Area of R.J. Burnside's AR Estimate Which is Applicable to The Site Area	0.38	0.35	<b>0.133</b>

Refer to Storm Drainage Plan in Appendix A, Drawing No ST - 1 by R.J. Burnside & Associates Limited

<b>Proposed Drainage to External Lands</b>	<b>Area (Ha)</b>	<b>Runoff Coefficient</b>	<b>AR</b>
Undeveloped runoff	0.15	0.25	0.038
Developed runoff	0.11	0.75	0.083
Total Area	0.26	Total AR=	<b>0.120</b>

Therefore, proposed AR is less than the original Estimate from R.J. Burnside & Associates.

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241 Reach St. Uxbridge

CN CALCULATION FOR HYDROLOGIC MODELLING

Lot Impervious Breakdown

Unit Type	0	Asphalt + curb (m)	S/W (m)	Lot Area (m <sup>2</sup> )	Impervious (m <sup>2</sup> )	Total Unit Area (m <sup>2</sup> )	Total Unit Impervious (m <sup>2</sup> )	Total Unit XImpervious (m <sup>2</sup> )	No. Lots	TIMP	XIMP
A	0.0	6.5	0.0	321.9	209.0	359.2	246.3	70.7	12	69%	20%
C	0.0	6.5	0.0	251.4	177.3	277.7	203.6	59.9	4	73%	22%
E	0.0	6.5	0.0	254.5	184.5	280.8	211.3	61.1	14	75%	22%
A	10.8	6.5	1.5	321.9	209.0	375.4	262.5	86.9	25	70%	23%
C	7.6	6.5	1.5	251.4	177.3	289.1	215.0	70.9	7	74%	25%
E	7.6	6.5	1.5	254.5	184.5	292.2	222.2	72.5	0	76%	25%
<b>Avg/Total</b>									<b>62</b>	<b>72%</b>	<b>22%</b>

*Based on the architectural Site Plan provided by Hunt Design Associates Inc.*

Catchment Description	Total Area (ha)	TIMP	XIMP	CN (NASHYD)	Combined Total Area	Combined TIMP	Combined XIMP	Combined CN	Applicable Hydrograph
Residential Units+ROW	2.31	72%	22%	77	2.56	0.69	0.23	75.14	StandHyd
Proposed Parking	0.08	100%	100%	98					
Snow Storage/ Extra Grassed Area	0.17	20%	0%	39					
LSRCA Woodlot	0.83	20%	0%	36	2.27	0.20	0.00	62.01	NasHyd
External Drainage Area	1.44	20%	0%	77					

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241 Reach St. Uxbridge  
Hydrologic Model Summary

Runoff Volume Summary (Model Verification)

Hydrograph Area (ha)	100 Year Runoff Volume - Burnside (mm)	100 Year Runoff Volume – SKA (mm)
17.39	41.243	41.24
13.00	22.555	22.55
1.00*	57.577	57.53
6.26	42.797	42.80

\*Cannot input '0.0' as slope in Visual OTTHYMO

Peak Flow Summary

Storm	Pre-Development	“Ultimate” Model (Burnside)		“Ultimate” Model (SKA)		Post-Development Model (SKA)	
	Peak Flow (cms)	Peak Flow (cms)	Volume (m <sup>3</sup> )	Peak Flow (cms)	Volume (m <sup>3</sup> )	Peak Flow (cms)	Volume (m <sup>3</sup> )
5 Year	0.35	0.16	3757	0.16	3746	0.14	3679
25 Year	0.62	0.50	4946	0.50	4958	0.48	4914
50 Year	0.74	0.67	5416	0.68	5439	0.66	5404
100 Year	0.88	0.86	5912	0.87	5959	0.85	5925

The Stormwater Management Design for ‘Estates of Avonlea’ by Coral Creek homes by Burnside Vincent Associates was reviewed. The modelling of contributing external areas, namely ‘Area G’, were underestimated in terms of both size and coverage under post development conditions. The SWMHYMO hydrologic assessment was remodelled using Visual OTTHYMO to assess the impact of the additional area contributing to the pond under true post development conditions. Required pond volume and pond outflow rate were the focal points of this assessment.

When modelled in VO, the ‘Ultimate’ site condition (i.e. the model using the assumptions made in the Avonlea SWM Report) produced flows and volumes that are similar to the SWMHYMO model (Summarized under “Ultimate” Model (Burnside) in the Peak Flow Summary table above). The VO results are summarized under the “Ultimate” Model (SKA) column in the Peak Flow Summary table above. The runoff volumes were assessed for both models to ensure hydrograph and rainfall parameters were input correctly (see above Runoff Volume Summary - Model Verification).

The VO model was then updated to reflect true post development conditions, incorporating representative site coverage, external areas and on-site storage. Per Appendix B of the LSRCA’s SWM Criteria, this site qualifies to account for infiltration measures as a means of peak flow reduction in the



hydrologic modelling. Under Step 1: Initial Screening, this site has an infiltration rate higher than 15mm/hr, does not have high groundwater levels and does not have any water quality issues. Therefore, no constraints exist. Proceeding to Step 2: Design Phase and Post Construction Phase, all criteria are met, allowing for credit to be given for the proposed on-site infiltration measures in the hydrologic modelling.

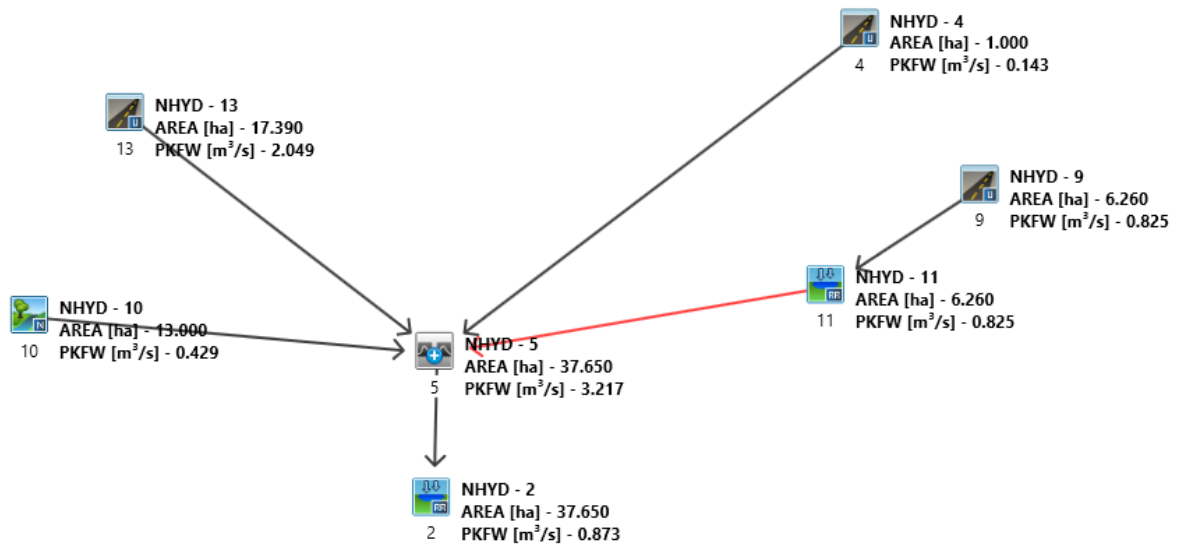
The storage-discharge curve used for the subject site was based on two requirements:

- 1) Allowable storm discharge from the subject site was identified as 221 l/s and 414 l/s for the 5 year and 100 year storms.
- 2) The peak flow and volumes produced from the "Post-Development Model (SKA)" should be equal to or less than the peak flow and volumes produced from the "Ultimate Model (Burnside)"

In order to satisfy requirement #1, the extended rational method was used to determine the amount of on-site storage needed and two orifice plates were sized to control the 5 year and 100 year storm event. The storage-discharge curve was then updated in the VO6 model and the results showed that the peak flow and volumes produced from the "Post-Development Model (SKA)" was greater than the peak flow and volumes produced from the "Ultimate Model (Burnside)", thus requirement #2 was not met. Adjustments were made to both orifice plates to further restrict the proposed sites discharge until requirement #2 was satisfied while maintaining requirement #1.

The results are summarized under the "Post-Development Model (SKA)" column in the Peak Flow Summary table above. These results show a minor reduction in both pond volume and pond outflow from the "Ultimate" SKA model and the "Ultimate" Burnside model. Under 100 Year conditions, the Post-Development model matches the pond volume and peak flow from the "Ultimate" Burnside model. All models show a reduction in peak flow from pre-development conditions.

# "ULTIMATE" MODEL (SKA)



```

=====
V V I SSSSS U U A L (v 6.0.2006)
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
WV I SSSSS UUUUU A A LLLLL

```

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000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y MM MM 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000

```

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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 6.0\VO2\voin.dat

Output filename:

C:\Users\kluong\AppData\Local\Civica\XH5\fe3c910a-0d24-4e78-afa2-f668f1d5a680\0c651e99-c2c2-42a9-948e-fc9eb9172416\scena

Summary filename:

C:\Users\kluong\AppData\Local\Civica\XH5\fe3c910a-0d24-4e78-afa2-f668f1d5a680\0c651e99-c2c2-42a9-948e-fc9eb9172416\scena

DATE: 02/22/2021

TIME: 11:37:44

USER:

COMMENTS: \_\_\_\_\_

```

*****
** SIMULATION : Run 01 **
*****

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```

-----
| READ STORM | Filename: C:\Users\kluong\AppData\Local\Temp\
| Ptotal= 86.65 mm | 023df4cd-9622-42cc-a4ac-4c62a4941e33\2c0d5959
| | Comments: 100-Year 12-Hour SCS II Design Storm
-----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	2.17	3.25	3.47	6.25	15.60	9.25	3.03
0.50	2.17	3.50	3.47	6.50	15.60	9.50	3.03
0.75	2.17	3.75	3.47	6.75	6.93	9.75	3.03
1.00	2.17	4.00	3.47	7.00	6.93	10.00	3.03
1.25	2.17	4.25	5.20	7.25	5.20	10.25	1.73
1.50	2.17	4.50	5.20	7.50	5.20	10.50	1.73
1.75	2.17	4.75	6.93	7.75	5.20	10.75	1.73
2.00	2.17	5.00	6.93	8.00	5.20	11.00	1.73
2.25	2.60	5.25	10.40	8.25	3.03	11.25	1.73
2.50	2.60	5.50	10.40	8.50	3.03	11.50	1.73
2.75	2.60	5.75	41.59	8.75	3.03	11.75	1.73
3.00	2.60	6.00	114.38	9.00	3.03	12.00	1.73

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| CALIB |
| NASHYD ( 0010) | Area (ha)= 13.00 Curve Number (CN)= 52.5
| ID= 1 DT= 1.0 min | Ia (mm)= 2.50 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.52
-----

```

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03

0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73

1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73

2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Unit Hyd Qpeak (cms)= 0.955

PEAK FLOW (cms)= 0.429 (i)  
 TIME TO PEAK (hrs)= 6.467  
 RUNOFF VOLUME (mm)= 22.555  
 TOTAL RAINFALL (mm)= 86.649  
 RUNOFF COEFFICIENT = 0.260

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

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 CALIB  
 STANDHYD ( 0004)  
 ID= 1 DT= 1.0 min  
 Area (ha)= 1.00  
 Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.55	0.45
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	0.01	0.01
Length (m)=	81.65	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03

0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73



1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max. Eff. Inten. (mm/hr)= 114.38 13.48  
 over (min) 9.00 86.00  
 Storage Coeff. (min)= 8.53 (ii) 85.64 (ii)  
 Unit Hyd. Tpeak (min)= 9.00 86.00  
 Unit Hyd. peak (cms)= 0.13 0.01

				*TOTALS*
PEAK FLOW	(cms)=	0.14	0.01	0.143 (iii)
TIME TO PEAK	(hrs)=	6.03	7.37	6.03
RUNOFF VOLUME	(mm)=	85.84	23.01	57.53
TOTAL RAINFALL	(mm)=	86.65	86.65	86.65
RUNOFF COEFFICIENT	=	0.99	0.27	0.66

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
CN\* = 52.5 Ia = Dep. 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 ( 0009) | Area (ha)= 6.26
| ID= 1 DT= 1.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 20.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	3.13	3.13
Dep. Storage	(mm)=	0.80	1.50
Average Slope	(%)=	2.00	2.00
Length	(m)=	204.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

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

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TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03

0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73

2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max.Eff.Inten.(mm/hr)=	114.38	82.25	
over (min)	5.00	11.00	
Storage Coeff. (min)=	3.02 (ii)	10.65 (ii)	
Unit Hyd. Tpeak (min)=	5.00	11.00	
Unit Hyd. peak (cms)=	0.31	0.11	
			*TOTALS*
PEAK FLOW (cms)=	0.39	0.48	0.825 (iii)
TIME TO PEAK (hrs)=	6.00	6.08	6.02
RUNOFF VOLUME (mm)=	85.84	32.03	42.80
TOTAL RAINFALL (mm)=	86.65	86.65	86.65
RUNOFF COEFFICIENT =	0.99	0.37	0.49

\*\*\*\*\* WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%  
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
CN\* = 52.5 Ia = Dep. 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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RESERVOIR( 0011)  
 IN= 2---> OUT= 1  
 DT= 1.0 min

OVERFLOW IS ON

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0000	0.0800
0.0000	0.0500	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 ( 0009)	6.260	0.825	6.02	42.80
OUTFLOW: ID= 1 ( 0011)	0.000	0.000	5.93	30.34
OVERFLOW: ID= 3 ( 0003)	6.260	0.825	6.02	30.34

TOTAL NUMBER OF SIMULATION OVERFLOW = 0  
 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00  
 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 0.00  
 TIME SHIFT OF PEAK FLOW (min)= -5.00  
 MAXIMUM STORAGE USED (ha.m.)= 0.0819

CALIB  
 STANDHYD ( 0013)  
 ID= 1 DT= 1.0 min

Area (ha)= 17.39  
 Total Imp(%)= 45.00 Dir. Conn.(%)= 20.00

	IMPERVIOUS (ha)	PERVIOUS (i)
Surface Area	7.83	9.56
Dep. Storage	0.80	1.50
Average Slope	2.00	2.00
Length	340.49	40.00
Mannings n	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03

0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73

1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max. Eff. Inten. (mm/hr)= 114.38 70.25  
over (min) 5.00 13.00  
Storage Coeff. (min)= 4.10 (ii) 12.23 (ii)  
Unit Hyd. Tpeak (min)= 5.00 13.00  
Unit Hyd. peak (cms)= 0.26 0.09

\*TOTALS\*  
PEAK FLOW (cms)= 1.07 1.16 2.049 (iii)  
TIME TO PEAK (hrs)= 6.00 6.12 6.02  
RUNOFF VOLUME (mm)= 85.85 30.09 41.24  
TOTAL RAINFALL (mm)= 86.65 86.65 86.65  
RUNOFF COEFFICIENT = 0.99 0.35 0.48

\*\*\*\*\* WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%  
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

- CN\* = 52.5 Ia = Dep. Storage (Above)  
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL  
THAN THE STORAGE COEFFICIENT.  
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD ( 0005) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0010):  13.00  0.429  6.47  22.55
+ ID2= 2 ( 0011):   6.26  0.825  6.02  30.34
=====
ID = 3 ( 0005):  19.26  1.025  6.03  25.08

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0005) |
| 3 + 2 = 1 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 3 ( 0005):  19.26  1.025  6.03  25.08
+ ID2= 2 ( 0013):  17.39  2.049  6.02  41.24
=====
ID = 1 ( 0005):  36.65  3.074  6.03  32.75

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0005) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0005):  36.65  3.074  6.03  32.75
+ ID2= 2 ( 0004):   1.00  0.143  6.03  57.53
=====
ID = 3 ( 0005):  37.65  3.217  6.03  33.41

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0002) |
| IN= 2---> OUT= 1 |
| DT= 1.0 min |
-----
          OVERFLOW IS OFF
          OUTFLOW   STORAGE | OUTFLOW   STORAGE
          (cms)     (ha.m.) | (cms)     (ha.m.)
          0.0000    0.0000 | 0.3670    0.4600
          0.0850    0.3450 | 0.8700    0.5950

          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
INFLOW : ID= 2 ( 0005)  37.650  3.217  6.03  33.41
OUTFLOW: ID= 1 ( 0002)  37.650  0.873  6.73  31.91

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PEAK FLOW REDUCTION [Qout/Qin](%)= 27.15  
TIME SHIFT OF PEAK FLOW (min)= 42.00  
MAXIMUM STORAGE USED (ha.m.)= 0.5959

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| CALIB |
| NASHYD ( 0038) | Area (ha)= 13.00 Curve Number (CN)= 52.5
| ID= 1 DT= 1.0 min | Ia (mm)= 2.50 # of Linear Res.(N)= 3.00
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          U.H. Tp(hrs)= 0.52

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NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

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          ----- TRANSFORMED HYETOGRAPH -----
          TIME   RAIN | TIME   RAIN | TIME   RAIN | TIME   RAIN
          hrs  mm/hr | hrs  mm/hr | hrs  mm/hr | hrs  mm/hr
0.017  2.17 | 3.017  3.47 | 6.017  15.60 | 9.02  3.03
0.033  2.17 | 3.033  3.47 | 6.033  15.60 | 9.03  3.03
0.050  2.17 | 3.050  3.47 | 6.050  15.60 | 9.05  3.03
0.067  2.17 | 3.067  3.47 | 6.067  15.60 | 9.07  3.03
0.083  2.17 | 3.083  3.47 | 6.083  15.60 | 9.08  3.03
0.100  2.17 | 3.100  3.47 | 6.100  15.60 | 9.10  3.03
0.117  2.17 | 3.117  3.47 | 6.117  15.60 | 9.12  3.03

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0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73

1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73

2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Unit Hyd Qpeak (cms)= 0.955

PEAK FLOW (cms)= 0.429 (i)  
 TIME TO PEAK (hrs)= 6.467  
 RUNOFF VOLUME (mm)= 22.555  
 TOTAL RAINFALL (mm)= 86.649  
 RUNOFF COEFFICIENT = 0.260

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

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 -----  
 CALIB  
 STANDHYD ( 0039)  
 ID= 1 DT= 1.0 min  
 Area (ha)= 17.39  
 Total Imp(%)= 45.00 Dir. Conn.(%)= 20.00  
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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	7.83	9.56
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	340.49	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03

0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73

1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max. Eff. Inten. (mm/hr)= 114.38 70.25  
over (min) 5.00 13.00  
Storage Coeff. (min)= 4.10 (ii) 12.23 (ii)  
Unit Hyd. Tpeak (min)= 5.00 13.00  
Unit Hyd. peak (cms)= 0.26 0.09

\*TOTALS\*

PEAK FLOW (cms)= 1.07 1.16 2.049 (iii)  
TIME TO PEAK (hrs)= 6.00 6.12 6.02  
RUNOFF VOLUME (mm)= 85.85 30.09 41.24  
TOTAL RAINFALL (mm)= 86.65 86.65 86.65  
RUNOFF COEFFICIENT = 0.99 0.35 0.48

\*\*\*\*\* WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%  
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
 CN\* = 52.5 Ia = Dep. 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 ( 0041) | Area (ha)= 1.00
| ID= 1 DT= 1.0 min | Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00
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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.55	0.45
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	0.01	0.01
Length (m)=	81.65	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03

0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73

2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max.Eff.Inten.(mm/hr)=	114.38	13.48	
over (min)	9.00	86.00	
Storage Coeff. (min)=	8.53 (ii)	85.64 (ii)	
Unit Hyd. Tpeak (min)=	9.00	86.00	
Unit Hyd. peak (cms)=	0.13	0.01	
			*TOTALS*
PEAK FLOW (cms)=	0.14	0.01	0.143 (iii)
TIME TO PEAK (hrs)=	6.03	7.37	6.03
RUNOFF VOLUME (mm)=	85.84	23.01	57.53
TOTAL RAINFALL (mm)=	86.65	86.65	86.65
RUNOFF COEFFICIENT =	0.99	0.27	0.66

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
CN\* = 52.5 Ia = Dep. 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 ( 0044)	Area (ha)= 6.26
ID= 1 DT= 1.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 20.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.13	3.13



Dep. Storage (mm)= 0.80 1.50  
 Average Slope (%)= 2.00 2.00  
 Length (m)= 204.29 40.00  
 Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73

1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73

2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max.Eff.Inten.(mm/hr)= 114.38 82.25  
over (min) = 5.00 11.00  
Storage Coeff. (min)= 3.02 (ii) 10.65 (ii)  
Unit Hyd. Tpeak (min)= 5.00 11.00  
Unit Hyd. peak (cms)= 0.31 0.11

\*TOTALS\*

PEAK FLOW (cms)= 0.39 0.48 0.825 (iii)  
TIME TO PEAK (hrs)= 6.00 6.08 6.02  
RUNOFF VOLUME (mm)= 85.84 32.03 42.80  
TOTAL RAINFALL (mm)= 86.65 86.65 86.65  
RUNOFF COEFFICIENT = 0.99 0.37 0.49

\*\*\*\*\* WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%  
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
CN\* = 52.5 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL  
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----  
|SOAKAWAY( 0051)| UNDERDRAIN: OFF  
|IN= 2--> OUT= 3 |  
|DT= 1.0 MIN | STORAGE LAYER:  
-----  
Length (m)=\*\*\*\*\* Height (m)= 0.50  
Porosity = 0.40 Initial Water Level (m)= 0.00  
Width (m)= 2.00 Mini Drawdown (hr)= 24.00  
Max. Drawdown (hr)= 9.09 Available Storage (cu.m.)=\*\*\*\*\*

NATIVE SOIL LAYER:  
Infiltration (m/hr) = 0.0220

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW:ID= 2	6.26	0.83	6.02	42.89
OVERFLOW:ID= 3	6.26	0.38	6.22	9.51

Volume Reduction Rate[(RVin-RVout)/RVin](%):  
If RVout= (Overflow) = 77.83  
Time to reach Max storage (Hr)= 6.20  
Volume of water for drawdown in LID (cu.m.)= 250.19  
Volume of maximum water storage (cu.m.)= 1075.20  
Calculated Drawdown Time (Hr)= 2.10

-----  
Junction Command(0052)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 3( 0051)	6.26	0.38	6.22	9.51
OUTFLOW: ID= 2( 0052)	6.26	0.38	6.22	9.51

-----  
 | ADD HYD ( 0043) |  
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 ( 0038):	13.00	0.429	6.47	22.55
+ ID2= 2 ( 0039):	17.39	2.049	6.02	41.24
=====				
ID = 3 ( 0043):	30.39	2.255	6.03	33.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----  
 | ADD HYD ( 0043) |  
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 ( 0043):	30.39	2.255	6.03	33.25
+ ID2= 2 ( 0041):	1.00	0.143	6.03	57.53
=====				
ID = 1 ( 0043):	31.39	2.398	6.03	34.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----  
 | ADD HYD ( 0043) |  
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 ( 0043):	31.39	2.398	6.03	34.02
+ ID2= 2 ( 0052):	6.26	0.377	6.22	9.51
=====				
ID = 3 ( 0043):	37.65	2.398	6.03	29.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----  
 | RESERVOIR( 0042) |  
 | IN= 2----> OUT= 1 |  
DT= 1.0 min

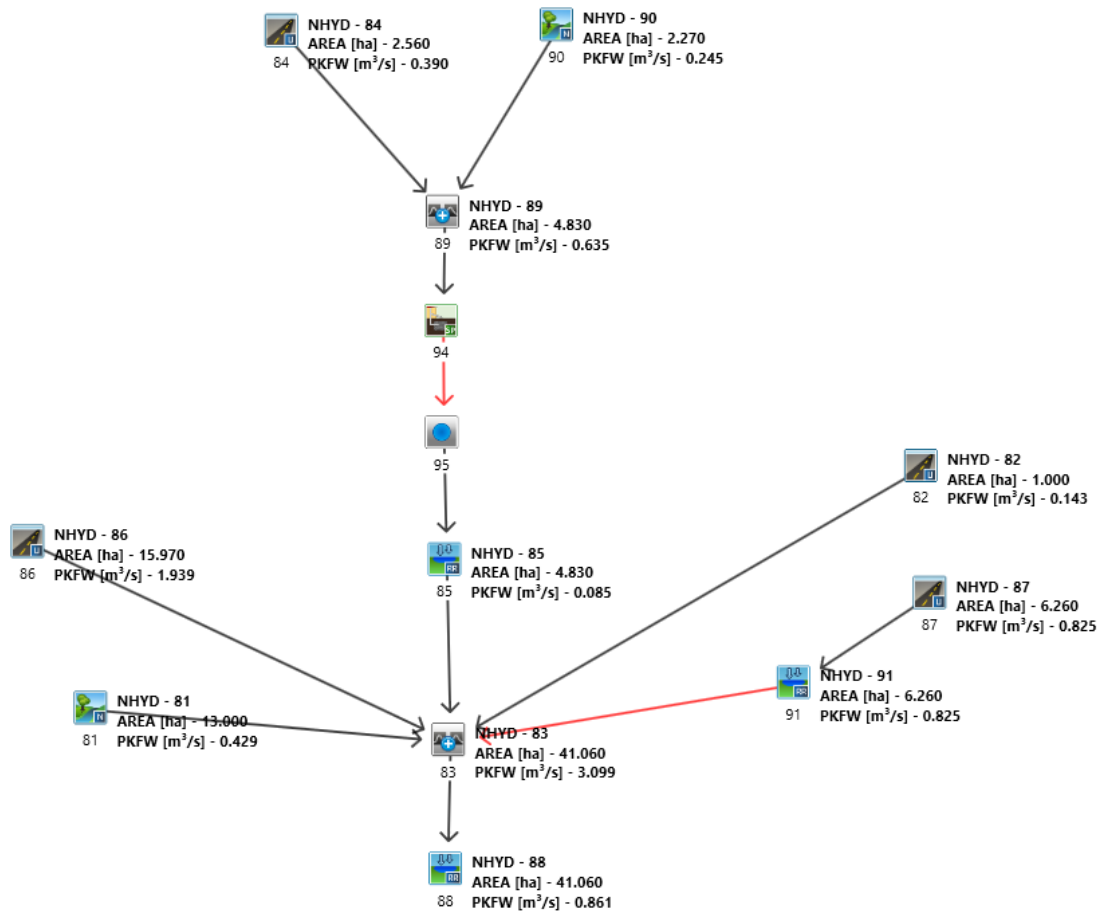
OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.3670	0.4600
0.0850	0.3450	0.8700	0.5950

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 ( 0043)	37.650	2.398	6.03	29.95
OUTFLOW: ID= 1 ( 0042)	37.650	0.748	6.82	28.47

PEAK FLOW REDUCTION [Qout/Qin](%)= 31.19  
 TIME SHIFT OF PEAK FLOW (min)= 47.00  
 MAXIMUM STORAGE USED (ha.m.)= 0.5623

## POST-DEVELOPMENT MODEL (SKA)



```

=====
V V I SSSS U U A L (v 6.0.2006)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
WV I SSSS UUUU A A LLLL

```

```

000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y MM MM 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000

```

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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 6.0\VO2\voin.dat

Output filename:

C:\Users\kluong\AppData\Local\Civica\XH5\fe3c910a-0d24-4e78-afa2-f668f1d5a680\fc225eec-6e8c-4ead-84c3-2739109e77be\scena

Summary filename:

C:\Users\kluong\AppData\Local\Civica\XH5\fe3c910a-0d24-4e78-afa2-f668f1d5a680\fc225eec-6e8c-4ead-84c3-2739109e77be\scena

DATE: 10/14/2021

TIME: 09:33:53

USER:

COMMENTS: \_\_\_\_\_

```

*****
** SIMULATION : Run 01 **
*****

```

```

-----
| READ STORM | Filename: C:\Users\kluong\AppData\Local\Temp\
| Ptotal= 86.65 mm | 408f457f-0095-47ec-a4eb-f28ad3defd55\2c0d5959
| | Comments: 100-Year 12-Hour SCS II Design Storm
-----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.25	2.17	3.25	3.47	6.25	15.60	9.25	3.03
0.50	2.17	3.50	3.47	6.50	15.60	9.50	3.03
0.75	2.17	3.75	3.47	6.75	6.93	9.75	3.03
1.00	2.17	4.00	3.47	7.00	6.93	10.00	3.03
1.25	2.17	4.25	5.20	7.25	5.20	10.25	1.73
1.50	2.17	4.50	5.20	7.50	5.20	10.50	1.73
1.75	2.17	4.75	6.93	7.75	5.20	10.75	1.73
2.00	2.17	5.00	6.93	8.00	5.20	11.00	1.73
2.25	2.60	5.25	10.40	8.25	3.03	11.25	1.73
2.50	2.60	5.50	10.40	8.50	3.03	11.50	1.73
2.75	2.60	5.75	41.59	8.75	3.03	11.75	1.73
3.00	2.60	6.00	114.38	9.00	3.03	12.00	1.73

```

-----
| CALIB |
| NASHYD ( 0081) | Area (ha)= 13.00 Curve Number (CN)= 52.5
| ID= 1 DT= 1.0 min | Ia (mm)= 2.50 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.52
-----

```

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03

0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73

1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73



2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Unit Hyd Qpeak (cms)= 0.955

PEAK FLOW (cms)= 0.429 (i)  
 TIME TO PEAK (hrs)= 6.467  
 RUNOFF VOLUME (mm)= 22.555  
 TOTAL RAINFALL (mm)= 86.649  
 RUNOFF COEFFICIENT = 0.260

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

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| CALIB |
| NASHYD ( 0090) | Area (ha)= 2.27 Curve Number (CN)= 62.0
| ID= 1 DT= 1.0 min | Ia (mm)= 8.70 # of Linear Res.(N)= 3.00
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| U.H. Tp(hrs)= 0.09

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NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03

0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73

1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Unit Hyd Qpeak (cms)= 0.913

PEAK FLOW (cms)= 0.245 (i)  
 TIME TO PEAK (hrs)= 6.017  
 RUNOFF VOLUME (mm)= 26.014  
 TOTAL RAINFALL (mm)= 86.649  
 RUNOFF COEFFICIENT = 0.300

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

-----  
 | CALIB |  
 | STANDHYD ( 0084) |  
ID= 1 DT= 1.0 min

Area (ha)= 2.56  
 Total Imp(%)= 69.00 Dir. Conn.(%)= 23.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.77	0.79
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	130.64	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73

1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73

2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max.Eff.Inten.(mm/hr)= 114.38 150.56  
over (min) 5.00 11.00  
Storage Coeff. (min)= 2.84 (ii) 10.38 (ii)  
Unit Hyd. Tpeak (min)= 5.00 11.00  
Unit Hyd. peak (cms)= 0.32 0.11

\*TOTALS\*

PEAK FLOW (cms)= 0.19 0.23 0.390 (iii)  
TIME TO PEAK (hrs)= 6.00 6.08 6.02  
RUNOFF VOLUME (mm)= 85.65 37.49 48.56  
TOTAL RAINFALL (mm)= 86.65 86.65 86.65  
RUNOFF COEFFICIENT = 0.99 0.43 0.56

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
CN\* = 49.0 Ia = Dep. Storage (Above)  
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL  
THAN THE STORAGE COEFFICIENT.  
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-----
| ADD HYD ( 0089) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0084):  2.56  0.390  6.02  48.56
+ ID2= 2 ( 0090):  2.27  0.245  6.02  26.01
=====
ID = 3 ( 0089):  4.83  0.635  6.02  37.97

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
|SOAKAWAY( 0094)| UNDERDRAIN: OFF
|IN= 2--> OUT= 3|
|DT= 1.0 MIN |
-----
STORAGE LAYER:
Length      (m)=290.00  Height      (m)= 1.00
Porosity    = 1.00   Initial Water Level (m)= 0.00

```

Width (m)= 3.00 Mini Drawdown (hr)= 24.00  
 Max. Drawdown (hr)= Inf Available Storage (cu.m.)=870.00

NATIVE SOIL LAYER:  
 Infiltration (m/hr) = 0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW:ID= 2	4.83	0.64	6.02	37.97
OVERFLOW:ID= 3	4.83	0.41	6.13	19.95

Volume Reduction Rate[(RVin-RVout)/RVin](%):  
 If RVout= (Overflow) = 47.44  
 Time to reach Max storage (Hr)= 6.12  
 Volume of water for drawdown in LID (cu.m.)= 870.00  
 Volume of maximum water storage (cu.m.)= 870.00  
 \*\*\*\* After simulation, water volume is not zero.

-----  
Junction Command(0095)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 3( 0094)	4.83	0.41	6.13	19.95
OUTFLOW: ID= 2( 0095)	4.83	0.41	6.13	19.95

-----  
 | RESERVOIR( 0085) |  
 | IN= 2---> OUT= 1 |  
DT= 1.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1970	0.0407
0.0190	0.0000	0.2690	0.0486
0.0390	0.0022	0.3390	0.0593
0.0650	0.0123	0.3670	0.0636
0.0690	0.0146	0.3780	0.0652
0.0850	0.0242	0.3890	0.0668
0.0860	0.0244	0.4000	0.0684
0.1540	0.0359	0.4140	0.0705

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 ( 0095)	4.830	0.409	6.13	19.95
OUTFLOW: ID= 1 ( 0085)	4.830	0.085	6.70	19.95

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.77  
 TIME SHIFT OF PEAK FLOW (min)= 34.00  
 MAXIMUM STORAGE USED (ha.m.)= 0.0242

\*\*\*\* WARNING : HYDROGRAPH WAS CUT. CHECK VOLUME.

-----  
 | CALIB |  
 | STANDHYD ( 0082) |  
ID= 1 DT= 1.0 min

Area (ha)= 1.00  
 Total Imp(%)= 55.00 Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.55	0.45
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	0.01	0.01
Length (m)=	81.65	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03

0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73



1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73

2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max.Eff.Inten.(mm/hr)= 114.38 13.48  
over (min) 9.00 86.00  
Storage Coeff. (min)= 8.53 (ii) 85.64 (ii)  
Unit Hyd. Tpeak (min)= 9.00 86.00  
Unit Hyd. peak (cms)= 0.13 0.01

\*TOTALS\*

PEAK FLOW (cms)= 0.14 0.01 0.143 (iii)  
TIME TO PEAK (hrs)= 6.03 7.37 6.03  
RUNOFF VOLUME (mm)= 85.84 23.01 57.53  
TOTAL RAINFALL (mm)= 86.65 86.65 86.65  
RUNOFF COEFFICIENT = 0.99 0.27 0.66

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
CN\* = 52.5 Ia = Dep. 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 ( 0086) | Area (ha)= 15.97  
| ID= 1 DT= 1.0 min | Total Imp(%)= 45.00 Dir. Conn.(%)= 22.00  
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	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	7.19	8.78
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	326.29	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03

0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03
0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73

1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73
2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max.Eff.Inten.(mm/hr)= 114.38 67.34  
over (min) 5.00 13.00  
Storage Coeff. (min)= 4.00 (ii) 12.27 (ii)

Unit Hyd. Tpeak (min)= 5.00 13.00  
 Unit Hyd. peak (cms)= 0.26 0.09

\*TOTALS\*

PEAK FLOW (cms)= 1.08 1.02 1.939 (iii)  
 TIME TO PEAK (hrs)= 6.00 6.12 6.02  
 RUNOFF VOLUME (mm)= 85.84 29.58 41.96  
 TOTAL RAINFALL (mm)= 86.65 86.65 86.65  
 RUNOFF COEFFICIENT = 0.99 0.34 0.48

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
 CN\* = 52.5 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL  
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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 | CALIB |  
 | STANDHYD ( 0087) | Area (ha)= 6.26  
 | ID= 1 DT= 1.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 20.00  
 |-----|

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	3.13	3.13
Dep. Storage (mm)=	0.80	1.50
Average Slope (%)=	2.00	2.00
Length (m)=	204.29	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	2.17	3.017	3.47	6.017	15.60	9.02	3.03
0.033	2.17	3.033	3.47	6.033	15.60	9.03	3.03
0.050	2.17	3.050	3.47	6.050	15.60	9.05	3.03
0.067	2.17	3.067	3.47	6.067	15.60	9.07	3.03
0.083	2.17	3.083	3.47	6.083	15.60	9.08	3.03
0.100	2.17	3.100	3.47	6.100	15.60	9.10	3.03
0.117	2.17	3.117	3.47	6.117	15.60	9.12	3.03
0.133	2.17	3.133	3.47	6.133	15.60	9.13	3.03
0.150	2.17	3.150	3.47	6.150	15.60	9.15	3.03
0.167	2.17	3.167	3.47	6.167	15.60	9.17	3.03
0.183	2.17	3.183	3.47	6.183	15.60	9.18	3.03
0.200	2.17	3.200	3.47	6.200	15.60	9.20	3.03
0.217	2.17	3.217	3.47	6.217	15.60	9.22	3.03
0.233	2.17	3.233	3.47	6.233	15.60	9.23	3.03
0.250	2.17	3.250	3.47	6.250	15.60	9.25	3.03
0.267	2.17	3.267	3.47	6.267	15.60	9.27	3.03
0.283	2.17	3.283	3.47	6.283	15.60	9.28	3.03
0.300	2.17	3.300	3.47	6.300	15.60	9.30	3.03
0.317	2.17	3.317	3.47	6.317	15.60	9.32	3.03
0.333	2.17	3.333	3.47	6.333	15.60	9.33	3.03
0.350	2.17	3.350	3.47	6.350	15.60	9.35	3.03
0.367	2.17	3.367	3.47	6.367	15.60	9.37	3.03
0.383	2.17	3.383	3.47	6.383	15.60	9.38	3.03
0.400	2.17	3.400	3.47	6.400	15.60	9.40	3.03
0.417	2.17	3.417	3.47	6.417	15.60	9.42	3.03
0.433	2.17	3.433	3.47	6.433	15.60	9.43	3.03
0.450	2.17	3.450	3.47	6.450	15.60	9.45	3.03
0.467	2.17	3.467	3.47	6.467	15.60	9.47	3.03
0.483	2.17	3.483	3.47	6.483	15.60	9.48	3.03
0.500	2.17	3.500	3.47	6.500	15.58	9.50	3.03
0.517	2.17	3.517	3.47	6.517	6.93	9.52	3.03
0.533	2.17	3.533	3.47	6.533	6.93	9.53	3.03
0.550	2.17	3.550	3.47	6.550	6.93	9.55	3.03
0.567	2.17	3.567	3.47	6.567	6.93	9.57	3.03
0.583	2.17	3.583	3.47	6.583	6.93	9.58	3.03
0.600	2.17	3.600	3.47	6.600	6.93	9.60	3.03
0.617	2.17	3.617	3.47	6.617	6.93	9.62	3.03
0.633	2.17	3.633	3.47	6.633	6.93	9.63	3.03
0.650	2.17	3.650	3.47	6.650	6.93	9.65	3.03
0.667	2.17	3.667	3.47	6.667	6.93	9.67	3.03
0.683	2.17	3.683	3.47	6.683	6.93	9.68	3.03
0.700	2.17	3.700	3.47	6.700	6.93	9.70	3.03
0.717	2.17	3.717	3.47	6.717	6.93	9.72	3.03
0.733	2.17	3.733	3.47	6.733	6.93	9.73	3.03

0.750	2.17	3.750	3.47	6.750	6.93	9.75	3.03
0.767	2.17	3.767	3.47	6.767	6.93	9.77	3.03
0.783	2.17	3.783	3.47	6.783	6.93	9.78	3.03
0.800	2.17	3.800	3.47	6.800	6.93	9.80	3.03
0.817	2.17	3.817	3.47	6.817	6.93	9.82	3.03
0.833	2.17	3.833	3.47	6.833	6.93	9.83	3.03
0.850	2.17	3.850	3.47	6.850	6.93	9.85	3.03
0.867	2.17	3.867	3.47	6.867	6.93	9.87	3.03
0.883	2.17	3.883	3.47	6.883	6.93	9.88	3.03
0.900	2.17	3.900	3.47	6.900	6.93	9.90	3.03
0.917	2.17	3.917	3.47	6.917	6.93	9.92	3.03
0.933	2.17	3.933	3.47	6.933	6.93	9.93	3.03
0.950	2.17	3.950	3.47	6.950	6.93	9.95	3.03
0.967	2.17	3.967	3.47	6.967	6.93	9.97	3.03
0.983	2.17	3.983	3.47	6.983	6.93	9.98	3.03
1.000	2.17	4.000	3.47	7.000	6.93	10.00	3.03
1.017	2.17	4.017	5.20	7.017	5.20	10.02	1.73
1.033	2.17	4.033	5.20	7.033	5.20	10.03	1.73
1.050	2.17	4.050	5.20	7.050	5.20	10.05	1.73
1.067	2.17	4.067	5.20	7.067	5.20	10.07	1.73
1.083	2.17	4.083	5.20	7.083	5.20	10.08	1.73
1.100	2.17	4.100	5.20	7.100	5.20	10.10	1.73
1.117	2.17	4.117	5.20	7.117	5.20	10.12	1.73
1.133	2.17	4.133	5.20	7.133	5.20	10.13	1.73
1.150	2.17	4.150	5.20	7.150	5.20	10.15	1.73
1.167	2.17	4.167	5.20	7.167	5.20	10.17	1.73
1.183	2.17	4.183	5.20	7.183	5.20	10.18	1.73
1.200	2.17	4.200	5.20	7.200	5.20	10.20	1.73
1.217	2.17	4.217	5.20	7.217	5.20	10.22	1.73
1.233	2.17	4.233	5.20	7.233	5.20	10.23	1.73
1.250	2.17	4.250	5.20	7.250	5.20	10.25	1.73
1.267	2.17	4.267	5.20	7.267	5.20	10.27	1.73
1.283	2.17	4.283	5.20	7.283	5.20	10.28	1.73
1.300	2.17	4.300	5.20	7.300	5.20	10.30	1.73
1.317	2.17	4.317	5.20	7.317	5.20	10.32	1.73
1.333	2.17	4.333	5.20	7.333	5.20	10.33	1.73
1.350	2.17	4.350	5.20	7.350	5.20	10.35	1.73
1.367	2.17	4.367	5.20	7.367	5.20	10.37	1.73
1.383	2.17	4.383	5.20	7.383	5.20	10.38	1.73
1.400	2.17	4.400	5.20	7.400	5.20	10.40	1.73
1.417	2.17	4.417	5.20	7.417	5.20	10.42	1.73
1.433	2.17	4.433	5.20	7.433	5.20	10.43	1.73
1.450	2.17	4.450	5.20	7.450	5.20	10.45	1.73
1.467	2.17	4.467	5.20	7.467	5.20	10.47	1.73
1.483	2.17	4.483	5.20	7.483	5.20	10.48	1.73
1.500	2.17	4.500	5.20	7.500	5.20	10.50	1.73
1.517	2.17	4.517	6.93	7.517	5.20	10.52	1.73
1.533	2.17	4.533	6.93	7.533	5.20	10.53	1.73
1.550	2.17	4.550	6.93	7.550	5.20	10.55	1.73
1.567	2.17	4.567	6.93	7.567	5.20	10.57	1.73
1.583	2.17	4.583	6.93	7.583	5.20	10.58	1.73
1.600	2.17	4.600	6.93	7.600	5.20	10.60	1.73
1.617	2.17	4.617	6.93	7.617	5.20	10.62	1.73
1.633	2.17	4.633	6.93	7.633	5.20	10.63	1.73
1.650	2.17	4.650	6.93	7.650	5.20	10.65	1.73
1.667	2.17	4.667	6.93	7.667	5.20	10.67	1.73
1.683	2.17	4.683	6.93	7.683	5.20	10.68	1.73
1.700	2.17	4.700	6.93	7.700	5.20	10.70	1.73
1.717	2.17	4.717	6.93	7.717	5.20	10.72	1.73
1.733	2.17	4.733	6.93	7.733	5.20	10.73	1.73
1.750	2.17	4.750	6.93	7.750	5.20	10.75	1.73
1.767	2.17	4.767	6.93	7.767	5.20	10.77	1.73
1.783	2.17	4.783	6.93	7.783	5.20	10.78	1.73
1.800	2.17	4.800	6.93	7.800	5.20	10.80	1.73
1.817	2.17	4.817	6.93	7.817	5.20	10.82	1.73
1.833	2.17	4.833	6.93	7.833	5.20	10.83	1.73
1.850	2.17	4.850	6.93	7.850	5.20	10.85	1.73
1.867	2.17	4.867	6.93	7.867	5.20	10.87	1.73
1.883	2.17	4.883	6.93	7.883	5.20	10.88	1.73
1.900	2.17	4.900	6.93	7.900	5.20	10.90	1.73
1.917	2.17	4.917	6.93	7.917	5.20	10.92	1.73
1.933	2.17	4.933	6.93	7.933	5.20	10.93	1.73
1.950	2.17	4.950	6.93	7.950	5.20	10.95	1.73
1.967	2.17	4.967	6.93	7.967	5.20	10.97	1.73
1.983	2.17	4.983	6.93	7.983	5.20	10.98	1.73
2.000	2.17	5.000	6.93	8.000	5.19	11.00	1.73
2.017	2.60	5.017	10.40	8.017	3.03	11.02	1.73
2.033	2.60	5.033	10.40	8.033	3.03	11.03	1.73
2.050	2.60	5.050	10.40	8.050	3.03	11.05	1.73

2.067	2.60	5.067	10.40	8.067	3.03	11.07	1.73
2.083	2.60	5.083	10.40	8.083	3.03	11.08	1.73
2.100	2.60	5.100	10.40	8.100	3.03	11.10	1.73
2.117	2.60	5.117	10.40	8.117	3.03	11.12	1.73
2.133	2.60	5.133	10.40	8.133	3.03	11.13	1.73
2.150	2.60	5.150	10.40	8.150	3.03	11.15	1.73
2.167	2.60	5.167	10.40	8.167	3.03	11.17	1.73
2.183	2.60	5.183	10.40	8.183	3.03	11.18	1.73
2.200	2.60	5.200	10.40	8.200	3.03	11.20	1.73
2.217	2.60	5.217	10.40	8.217	3.03	11.22	1.73
2.233	2.60	5.233	10.40	8.233	3.03	11.23	1.73
2.250	2.60	5.250	10.40	8.250	3.03	11.25	1.73
2.267	2.60	5.267	10.40	8.267	3.03	11.27	1.73
2.283	2.60	5.283	10.40	8.283	3.03	11.28	1.73
2.300	2.60	5.300	10.40	8.300	3.03	11.30	1.73
2.317	2.60	5.317	10.40	8.317	3.03	11.32	1.73
2.333	2.60	5.333	10.40	8.333	3.03	11.33	1.73
2.350	2.60	5.350	10.40	8.350	3.03	11.35	1.73
2.367	2.60	5.367	10.40	8.367	3.03	11.37	1.73
2.383	2.60	5.383	10.40	8.383	3.03	11.38	1.73
2.400	2.60	5.400	10.40	8.400	3.03	11.40	1.73
2.417	2.60	5.417	10.40	8.417	3.03	11.42	1.73
2.433	2.60	5.433	10.40	8.433	3.03	11.43	1.73
2.450	2.60	5.450	10.40	8.450	3.03	11.45	1.73
2.467	2.60	5.467	10.40	8.467	3.03	11.47	1.73
2.483	2.60	5.483	10.40	8.483	3.03	11.48	1.73
2.500	2.60	5.500	10.43	8.500	3.03	11.50	1.73
2.517	2.60	5.517	41.59	8.517	3.03	11.52	1.73
2.533	2.60	5.533	41.59	8.533	3.03	11.53	1.73
2.550	2.60	5.550	41.59	8.550	3.03	11.55	1.73
2.567	2.60	5.567	41.59	8.567	3.03	11.57	1.73
2.583	2.60	5.583	41.59	8.583	3.03	11.58	1.73
2.600	2.60	5.600	41.59	8.600	3.03	11.60	1.73
2.617	2.60	5.617	41.59	8.617	3.03	11.62	1.73
2.633	2.60	5.633	41.59	8.633	3.03	11.63	1.73
2.650	2.60	5.650	41.59	8.650	3.03	11.65	1.73
2.667	2.60	5.667	41.59	8.667	3.03	11.67	1.73
2.683	2.60	5.683	41.59	8.683	3.03	11.68	1.73
2.700	2.60	5.700	41.59	8.700	3.03	11.70	1.73
2.717	2.60	5.717	41.59	8.717	3.03	11.72	1.73
2.733	2.60	5.733	41.59	8.733	3.03	11.73	1.73
2.750	2.60	5.750	41.68	8.750	3.03	11.75	1.73
2.767	2.60	5.767	114.38	8.767	3.03	11.77	1.73
2.783	2.60	5.783	114.38	8.783	3.03	11.78	1.73
2.800	2.60	5.800	114.38	8.800	3.03	11.80	1.73
2.817	2.60	5.817	114.38	8.817	3.03	11.82	1.73
2.833	2.60	5.833	114.38	8.833	3.03	11.83	1.73
2.850	2.60	5.850	114.38	8.850	3.03	11.85	1.73
2.867	2.60	5.867	114.38	8.867	3.03	11.87	1.73
2.883	2.60	5.883	114.38	8.883	3.03	11.88	1.73
2.900	2.60	5.900	114.38	8.900	3.03	11.90	1.73
2.917	2.60	5.917	114.38	8.917	3.03	11.92	1.73
2.933	2.60	5.933	114.38	8.933	3.03	11.93	1.73
2.950	2.60	5.950	114.38	8.950	3.03	11.95	1.73
2.967	2.60	5.967	114.38	8.967	3.03	11.97	1.73
2.983	2.60	5.983	114.38	8.983	3.03	11.98	1.73
3.000	2.60	6.000	114.24	9.000	3.03	12.00	1.73

Max.Eff.Inten.(mm/hr)=	114.38	82.25	
over (min)	5.00	11.00	
Storage Coeff. (min)=	3.02 (ii)	10.65 (ii)	
Unit Hyd. Tpeak (min)=	5.00	11.00	
Unit Hyd. peak (cms)=	0.31	0.11	
			*TOTALS*
PEAK FLOW (cms)=	0.39	0.48	0.825 (iii)
TIME TO PEAK (hrs)=	6.00	6.08	6.02
RUNOFF VOLUME (mm)=	85.84	32.03	42.80
TOTAL RAINFALL (mm)=	86.65	86.65	86.65
RUNOFF COEFFICIENT =	0.99	0.37	0.49

\*\*\*\*\* WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%  
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:  
CN\* = 52.5 Ia = Dep. 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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-----
| RESERVOIR( 0091) | OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT= 1.0 min      |
-----

```

	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0000	0.0800
	0.0000	0.0500	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 ( 0087)	6.260	0.825	6.02	42.80
OUTFLOW: ID= 1 ( 0091)	0.000	0.000	5.93	30.34
OVERFLOW: ID= 3 ( 0003)	6.260	0.825	6.02	30.34

TOTAL NUMBER OF SIMULATION OVERFLOW = 0  
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00  
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 0.00  
TIME SHIFT OF PEAK FLOW (min)= -5.00  
MAXIMUM STORAGE USED (ha.m.)= 0.0819

```

-----
| ADD HYD ( 0083) |
| 1 + 2 = 3      |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 ( 0081):	13.00	0.429	6.47	22.55
+ ID2= 2 ( 0082):	1.00	0.143	6.03	57.53
=====				
ID = 3 ( 0083):	14.00	0.467	6.42	25.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0083) |
| 3 + 2 = 1      |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 ( 0083):	14.00	0.467	6.42	25.05
+ ID2= 2 ( 0085):	4.83	0.085	6.70	19.95
=====				
ID = 1 ( 0083):	18.83	0.546	6.45	23.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0083) |
| 1 + 2 = 3      |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 ( 0083):	18.83	0.546	6.45	23.74
+ ID2= 2 ( 0086):	15.97	1.939	6.02	41.96
=====				
ID = 3 ( 0083):	34.80	2.281	6.03	32.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0083) |
| 3 + 2 = 1      |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 ( 0083):	34.80	2.281	6.03	32.10
+ ID2= 2 ( 0091):	6.26	0.825	6.02	30.34
=====				
ID = 1 ( 0083):	41.06	3.099	6.03	31.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0088) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 1.0 min      |
-----

```

	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.3670	0.4600
	0.0000	0.0000	0.8700	0.5950



0.0850    0.3450    |    0.0000    0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 ( 0083)	41.060	3.099	6.03	31.84
OUTFLOW: ID= 1 ( 0088)	41.060	0.861	6.80	30.45


PEAK FLOW REDUCTION [Qout/Qin](%)= 27.77  
TIME SHIFT OF PEAK FLOW (min)= 46.00  
MAXIMUM STORAGE USED (ha.m.)= 0.5925

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**APPENDIX C**  
**Storm Sewer Design Sheet**

**STORM SEWER DESIGN SHEET  
5 YEAR, 25 YEAR, AND 100 YEAR STORMS  
TOWNSHIP OF UXBRIDGE**

STREET	Upstream MH	Downstream MH	A at R=0.25 (ha) "Parks"	A at R=0.45 (ha) "Single-Fam"	A at R=0.75 (ha) "Townhouses"	A at R=0.85 (ha) "Paved Areas"	A x R this section (ha)	Acc. AR (ha)	t (min)	I (5yr) (mm/hr)	Q (5yr) (l/s)	I (25yr) (mm/hr)	Q (25yr) (l/s)	I (100yr) (mm/hr)	Q (100yr) (l/s)	Captured Overland Flow (l/s)	Acc. Captured Overland	Q (Design) (l/s)	Pipe	Pipe (mm)	Grade (%)	Capacity (l/s)	Velocity (m/s)	Length (m)	Time (min)	Total Time (min)	Downstream Invert	Upstream Invert	% Capacity
Street A	1	2				0.06	0.051	0.051	10.00	107.01	15.16	154.64	21.91	200.63	28.42		0.00	15.16	METRIC	300	2.00	136.76	1.93	33.2	0.29	10.29		0.66	11.1%
Street A	RYCB3	2	1		0.14		0.355	0.355	10.00	107.01	105.52	154.64	152.49	200.63	197.85	92.32	92.32	197.85	METRIC	300	3.60	183.48	2.60	31.0	0.20	10.20		1.12	57.5%
Street A	2	3					0.000	0.406	10.29	105.43	118.90	152.19	171.64	197.58	222.83		92.32	211.22	METRIC	375	3.00	303.68	2.75	6.5	0.04	10.33		0.20	39.2%
Street A	3	5			0.29	0.24	0.422	0.828	10.33	105.21	241.84	151.87	349.08	197.17	453.23		92.32	334.17	IMPERIAL	450	3.60	564.34	3.44	86.7	0.42	10.75		3.12	42.9%
Street A	RYCB13	CBMH4			0.29		0.218	0.218	10.00	107.01	64.65	154.64	93.43	200.63	121.22	56.57	56.57	121.22	METRIC	300	1.00	96.70	1.37	34.0	0.41	10.41		0.34	66.9%
Street A	CBMH4	5			0.10		0.075	0.293	10.00	107.01	86.94	154.64	125.64	200.63	163.01		56.57	143.51	METRIC	375	0.50	123.98	1.12	31.0	0.46	10.46		0.16	70.1%
Street A	5	6					0.000	1.120	10.00	107.01	332.91	154.64	481.10	200.63	624.19		148.89	481.80	IMPERIAL	600	1.00	640.56	2.19	25.5	0.19	10.19		0.26	52.0%
Street C	RLCB6	26	0.25		0.16		0.183	0.183	13.62	90.25	45.75	129.04	65.41	168.40	85.37	39.62	39.62	85.37	METRIC	375	3.30	318.50	2.88	33.0	0.19	13.81		1.09	14.4%
Street C	26	6					0.000	0.183	13.62	90.25	45.75	129.04	65.41	168.40	85.37		39.62	85.37	METRIC	375	3.30	318.50	2.88	7.5	0.04	13.66		0.25	14.4%
Street C	6	7				0.08	0.068	1.371	10.19	105.93	403.27	152.97	582.37	198.56	755.90		188.51	591.78	IMPERIAL	600	1.00	640.56	2.19	21.5	0.16	10.36		0.22	63.0%
Street C	RLBC7	7	1.02		0.14		0.360	0.360	13.68	90.02	90.02	128.69	128.69	167.96	167.97	77.95	77.95	167.97	METRIC	375	1.45	211.13	1.91	35.0	0.31	13.99		0.51	42.6%
Street C	7	18					0.000	1.731	10.36	105.04	504.93	151.60	728.75	196.85	946.23		266.46	771.39	IMPERIAL	600	4.50	1358.84	4.66	32.5	0.12	10.47		1.46	37.2%
Street B	CBMH11	12			0.08		0.060	0.060	10.00	107.01	17.83	154.64	25.77	200.63	33.44		0.00	17.83	METRIC	300	0.40	61.16	0.87	31.7	0.61	10.61		0.13	29.2%
Street B	12	13					0.000	0.060	10.61	103.69	17.28	149.53	24.92	194.25	32.38		0.00	17.28	METRIC	375	0.40	110.89	1.00	16.4	0.27	10.88		0.07	15.6%
Street B	13	15			0.11	0.12	0.185	0.245	10.88	102.29	69.47	147.37	100.09	191.55	130.09	60.62	60.62	130.09	IMPERIAL	450	0.30	162.91	0.99	39.7	0.67	11.55		0.12	42.6%
Street B	15	16					0.000	0.245	11.55	99.03	67.26	142.37	96.70	185.27	125.83		60.62	127.88	IMPERIAL	525	0.20	200.65	0.90	7.7	0.14	11.69		0.02	33.5%
Street C	RLCB11	16			0.06		0.045	0.045	10.00	107.01	13.38	154.64	19.33	200.63	25.08			13.38	METRIC	300	1.00	96.70	1.37	33.5	0.41	10.41		0.34	13.8%
Street C	16	17			0.27		0.203	0.492	11.69	98.36	134.43	141.35	193.18	183.99	251.45	305.88	366.50	500.93	IMPERIAL	600	0.20	286.47	0.98	11.1	0.19	11.88		0.02	46.9%
Street C	17	18				0.10	0.085	0.577	11.88	97.49	156.26	140.03	224.44	182.32	292.22		366.50	522.77	IMPERIAL	675	0.20	392.18	1.06	69.1	1.08	12.97		0.14	39.8%
Street C	27	18			0.26		0.195	0.195	10.00	107.01	57.96	154.64	83.76	200.63	108.68		0.00	57.96	METRIC	300	1.00	96.70	1.37	3.0	0.04	10.04		0.03	59.9%
Street C	18	19					0.000	2.503	10.47	104.42	725.86	150.64	1047.19	195.65	1360.02		632.96	1358.82	IMPERIAL	675	1.50	1074.02	2.91	6.1	0.03	10.51		0.09	67.6%
Easment	19	24					0.000	2.503	10.51	104.23	724.57	150.36	1045.20	195.29	1357.53		632.96	1357.53	IMPERIAL	525	0.30	245.74	1.10	38.3	0.58	11.09		0.11	294.9%
Underground storage facilities provide capacity control.																													
Easment	MH24	25					0.000	0.000	10.51	104.23	0.00	150.36	0.00	195.29	0.00		0.00	88.00	METRIC	375	1.00	175.33	1.59	38.3	0.40	10.91		0.38	50.2%
Easment	MH25	25					0.000	0.000	10.51	104.23	0.00	150.36	0.00	195.29	0.00		0.00	0.00	IMPERIAL	525	1.00	448.66	2.01	38.3	0.32	10.83		0.38	0.0%
Orifice controls govern release rate. See SWM Brief for further detail.																													
Easment	24	Ex MH26					0.000	2.503	11.09	101.26	703.89	145.79	1013.43	189.56	1317.72		632.96	88.00	IMPERIAL	525	0.30	245.74	1.10	16.6	0.25	11.34		0.05	35.8%
System outlet designed for 5yr release rate - see Stormwater Management Design Brief for further information.																													

<b>PROJECT :</b>	Reach Street	<p align="center"><b>NOTES</b></p> <p>Town IDF Curve: <math>I_{5YR} = \frac{904}{(t+5)^{0.7880}}</math>      Regional IDF Curve: <math>I_{10YR} = \frac{3454}{(t+20)}</math></p> <p><math>I_{25YR} = \frac{1234}{(t+4)^{0.767}}</math>      <math>I_{25YR} = \frac{3454}{(t+20)} \times 1.1</math></p> <p><math>I_{100YR} = \frac{1799}{(t+5)^{0.810}}</math>      <math>I_{100YR} = \frac{3454}{(t+20)} \times 1.25</math></p>	<p>Designed: KLD</p> <p>Checked: WJL</p>	
<b>PROJECT NUMBER :</b>	17-386			
<b>CLIENT :</b>	Venetian Group			
<b>DATE :</b>	March 2021			

## External Area



**NHYD - 169**  
**AREA [ha] - 2.270**

169

\*\*\*\*\*  
 \*\* SIMULATION:Run 05 \*\*  
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| CALIB |
| NASHYD ( 0169) | Area (ha)= 2.27 Curve Number (CN)= 62.0
| ID= 1 DT= 1.0 min | Ia (mm)= 8.70 # of Linear Res.(N)= 3.00
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| U.H. Tp(hrs)= 0.09
  
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NOTE: RAINFALL WAS TRANSFORMED TO 1.0 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
0.017	4.00	3.017	12.00	6.017	22.00	9.02	50.00
0.033	4.00	3.033	12.00	6.033	22.00	9.03	50.00
0.050	4.00	3.050	12.00	6.050	22.00	9.05	50.00
0.067	4.00	3.067	12.00	6.067	22.00	9.07	50.00
0.083	4.00	3.083	12.00	6.083	22.00	9.08	50.00
0.100	4.00	3.100	12.00	6.100	22.00	9.10	50.00
0.117	4.00	3.117	12.00	6.117	22.00	9.12	50.00
0.133	4.00	3.133	12.00	6.133	22.00	9.13	50.00
0.150	4.00	3.150	12.00	6.150	22.00	9.15	50.00
0.167	4.00	3.167	12.00	6.167	22.00	9.17	50.00
0.183	4.00	3.183	12.00	6.183	22.00	9.18	50.00
0.200	4.00	3.200	12.00	6.200	22.00	9.20	50.00
0.217	4.00	3.217	12.00	6.217	22.00	9.22	50.00
0.233	4.00	3.233	12.00	6.233	22.00	9.23	50.00
0.250	4.00	3.250	12.00	6.250	22.00	9.25	50.00
0.267	4.00	3.267	12.00	6.267	22.00	9.27	50.00
0.283	4.00	3.283	12.00	6.283	22.00	9.28	50.00
0.300	4.00	3.300	12.00	6.300	22.00	9.30	50.00
0.317	4.00	3.317	12.00	6.317	22.00	9.32	50.00
0.333	4.00	3.333	12.00	6.333	22.00	9.33	50.00
0.350	4.00	3.350	12.00	6.350	22.00	9.35	50.00
0.367	4.00	3.367	12.00	6.367	22.00	9.37	50.00
0.383	4.00	3.383	12.00	6.383	22.00	9.38	50.00
0.400	4.00	3.400	12.00	6.400	22.00	9.40	50.00
0.417	4.00	3.417	12.00	6.417	22.00	9.42	50.00
0.433	4.00	3.433	12.00	6.433	22.00	9.43	50.00
0.450	4.00	3.450	12.00	6.450	22.00	9.45	50.00
0.467	4.00	3.467	12.00	6.467	22.00	9.47	50.00
0.483	4.00	3.483	12.00	6.483	22.00	9.48	50.00
0.500	4.00	3.500	12.00	6.500	22.01	9.50	50.01
0.517	8.00	3.517	12.00	6.517	26.00	9.52	56.00
0.533	8.00	3.533	12.00	6.533	26.00	9.53	56.00
0.550	8.00	3.550	12.00	6.550	26.00	9.55	56.00
0.567	8.00	3.567	12.00	6.567	26.00	9.57	56.00
0.583	8.00	3.583	12.00	6.583	26.00	9.58	56.00
0.600	8.00	3.600	12.00	6.600	26.00	9.60	56.00
0.617	8.00	3.617	12.00	6.617	26.00	9.62	56.00
0.633	8.00	3.633	12.00	6.633	26.00	9.63	56.00
0.650	8.00	3.650	12.00	6.650	26.00	9.65	56.00
0.667	8.00	3.667	12.00	6.667	26.00	9.67	56.00
0.683	8.00	3.683	12.00	6.683	26.00	9.68	56.00
0.700	8.00	3.700	12.00	6.700	26.00	9.70	56.00
0.717	8.00	3.717	12.00	6.717	26.00	9.72	56.00
0.733	8.00	3.733	12.00	6.733	26.00	9.73	56.00
0.750	8.00	3.750	12.00	6.750	26.00	9.75	56.00
0.767	8.00	3.767	12.00	6.767	26.00	9.77	56.00
0.783	8.00	3.783	12.00	6.783	26.00	9.78	56.00
0.800	8.00	3.800	12.00	6.800	26.00	9.80	56.00
0.817	8.00	3.817	12.00	6.817	26.00	9.82	56.00
0.833	8.00	3.833	12.00	6.833	26.00	9.83	56.00
0.850	8.00	3.850	12.00	6.850	26.00	9.85	56.00
0.867	8.00	3.867	12.00	6.867	26.00	9.87	56.00
0.883	8.00	3.883	12.00	6.883	26.00	9.88	56.00
0.900	8.00	3.900	12.00	6.900	26.00	9.90	56.00
0.917	8.00	3.917	12.00	6.917	26.00	9.92	56.00
0.933	8.00	3.933	12.00	6.933	26.00	9.93	56.00
0.950	8.00	3.950	12.00	6.950	26.00	9.95	56.00
0.967	8.00	3.967	12.00	6.967	26.00	9.97	56.00
0.983	8.00	3.983	12.00	6.983	26.00	9.98	56.00
1.000	8.00	4.000	12.00	7.000	25.97	10.00	55.98
1.017	4.00	4.017	16.00	7.017	12.00	10.02	38.00
1.033	4.00	4.033	16.00	7.033	12.00	10.03	38.00
1.050	4.00	4.050	16.00	7.050	12.00	10.05	38.00
1.067	4.00	4.067	16.00	7.067	12.00	10.07	38.00

1.083	4.00	4.083	16.00	7.083	12.00	10.08	38.00
1.100	4.00	4.100	16.00	7.100	12.00	10.10	38.00
1.117	4.00	4.117	16.00	7.117	12.00	10.12	38.00
1.133	4.00	4.133	16.00	7.133	12.00	10.13	38.00
1.150	4.00	4.150	16.00	7.150	12.00	10.15	38.00
1.167	4.00	4.167	16.00	7.167	12.00	10.17	38.00
1.183	4.00	4.183	16.00	7.183	12.00	10.18	38.00
1.200	4.00	4.200	16.00	7.200	12.00	10.20	38.00
1.217	4.00	4.217	16.00	7.217	12.00	10.22	38.00
1.233	4.00	4.233	16.00	7.233	12.00	10.23	38.00
1.250	4.00	4.250	16.00	7.250	12.00	10.25	38.00
1.267	4.00	4.267	16.00	7.267	12.00	10.27	38.00
1.283	4.00	4.283	16.00	7.283	12.00	10.28	38.00
1.300	4.00	4.300	16.00	7.300	12.00	10.30	38.00
1.317	4.00	4.317	16.00	7.317	12.00	10.32	38.00
1.333	4.00	4.333	16.00	7.333	12.00	10.33	38.00
1.350	4.00	4.350	16.00	7.350	12.00	10.35	38.00
1.367	4.00	4.367	16.00	7.367	12.00	10.37	38.00
1.383	4.00	4.383	16.00	7.383	12.00	10.38	38.00
1.400	4.00	4.400	16.00	7.400	12.00	10.40	38.00
1.417	4.00	4.417	16.00	7.417	12.00	10.42	38.00
1.433	4.00	4.433	16.00	7.433	12.00	10.43	38.00
1.450	4.00	4.450	16.00	7.450	12.00	10.45	38.00
1.467	4.00	4.467	16.00	7.467	12.00	10.47	38.00
1.483	4.00	4.483	16.00	7.483	12.00	10.48	38.00
1.500	4.00	4.500	16.00	7.500	12.00	10.50	38.00
1.517	4.00	4.517	18.00	7.517	12.00	10.52	38.00
1.533	4.00	4.533	18.00	7.533	12.00	10.53	38.00
1.550	4.00	4.550	18.00	7.550	12.00	10.55	38.00
1.567	4.00	4.567	18.00	7.567	12.00	10.57	38.00
1.583	4.00	4.583	18.00	7.583	12.00	10.58	38.00
1.600	4.00	4.600	18.00	7.600	12.00	10.60	38.00
1.617	4.00	4.617	18.00	7.617	12.00	10.62	38.00
1.633	4.00	4.633	18.00	7.633	12.00	10.63	38.00
1.650	4.00	4.650	18.00	7.650	12.00	10.65	38.00
1.667	4.00	4.667	18.00	7.667	12.00	10.67	38.00
1.683	4.00	4.683	18.00	7.683	12.00	10.68	38.00
1.700	4.00	4.700	18.00	7.700	12.00	10.70	38.00
1.717	4.00	4.717	18.00	7.717	12.00	10.72	38.00
1.733	4.00	4.733	18.00	7.733	12.00	10.73	38.00
1.750	4.00	4.750	18.00	7.750	12.00	10.75	38.00
1.767	4.00	4.767	18.00	7.767	12.00	10.77	38.00
1.783	4.00	4.783	18.00	7.783	12.00	10.78	38.00
1.800	4.00	4.800	18.00	7.800	12.00	10.80	38.00
1.817	4.00	4.817	18.00	7.817	12.00	10.82	38.00
1.833	4.00	4.833	18.00	7.833	12.00	10.83	38.00
1.850	4.00	4.850	18.00	7.850	12.00	10.85	38.00
1.867	4.00	4.867	18.00	7.867	12.00	10.87	38.00
1.883	4.00	4.883	18.00	7.883	12.00	10.88	38.00
1.900	4.00	4.900	18.00	7.900	12.00	10.90	38.00
1.917	4.00	4.917	18.00	7.917	12.00	10.92	38.00
1.933	4.00	4.933	18.00	7.933	12.00	10.93	38.00
1.950	4.00	4.950	18.00	7.950	12.00	10.95	38.00
1.967	4.00	4.967	18.00	7.967	12.00	10.97	38.00
1.983	4.00	4.983	18.00	7.983	12.00	10.98	38.00
2.000	4.00	5.000	18.00	8.000	12.00	11.00	37.99
2.017	6.00	5.017	12.00	8.017	12.00	11.02	14.00
2.033	6.00	5.033	12.00	8.033	12.00	11.03	14.00
2.050	6.00	5.050	12.00	8.050	12.00	11.05	14.00
2.067	6.00	5.067	12.00	8.067	12.00	11.07	14.00
2.083	6.00	5.083	12.00	8.083	12.00	11.08	14.00
2.100	6.00	5.100	12.00	8.100	12.00	11.10	14.00
2.117	6.00	5.117	12.00	8.117	12.00	11.12	14.00
2.133	6.00	5.133	12.00	8.133	12.00	11.13	14.00
2.150	6.00	5.150	12.00	8.150	12.00	11.15	14.00
2.167	6.00	5.167	12.00	8.167	12.00	11.17	14.00
2.183	6.00	5.183	12.00	8.183	12.00	11.18	14.00
2.200	6.00	5.200	12.00	8.200	12.00	11.20	14.00
2.217	6.00	5.217	12.00	8.217	12.00	11.22	14.00
2.233	6.00	5.233	12.00	8.233	12.00	11.23	14.00
2.250	6.00	5.250	12.00	8.250	12.00	11.25	14.00
2.267	6.00	5.267	12.00	8.267	12.00	11.27	14.00
2.283	6.00	5.283	12.00	8.283	12.00	11.28	14.00
2.300	6.00	5.300	12.00	8.300	12.00	11.30	14.00
2.317	6.00	5.317	12.00	8.317	12.00	11.32	14.00
2.333	6.00	5.333	12.00	8.333	12.00	11.33	14.00
2.350	6.00	5.350	12.00	8.350	12.00	11.35	14.00
2.367	6.00	5.367	12.00	8.367	12.00	11.37	14.00
2.383	6.00	5.383	12.00	8.383	12.00	11.38	14.00

2.400	6.00	5.400	12.00	8.400	12.00	11.40	14.00
2.417	6.00	5.417	12.00	8.417	12.00	11.42	14.00
2.433	6.00	5.433	12.00	8.433	12.00	11.43	14.00
2.450	6.00	5.450	12.00	8.450	12.00	11.45	14.00
2.467	6.00	5.467	12.00	8.467	12.00	11.47	14.00
2.483	6.00	5.483	12.00	8.483	12.00	11.48	14.00
2.500	6.00	5.500	12.00	8.500	12.00	11.50	14.00
2.517	8.00	5.517	14.00	8.517	14.00	11.52	12.00
2.533	8.00	5.533	14.00	8.533	14.00	11.53	12.00
2.550	8.00	5.550	14.00	8.550	14.00	11.55	12.00
2.567	8.00	5.567	14.00	8.567	14.00	11.57	12.00
2.583	8.00	5.583	14.00	8.583	14.00	11.58	12.00
2.600	8.00	5.600	14.00	8.600	14.00	11.60	12.00
2.617	8.00	5.617	14.00	8.617	14.00	11.62	12.00
2.633	8.00	5.633	14.00	8.633	14.00	11.63	12.00
2.650	8.00	5.650	14.00	8.650	14.00	11.65	12.00
2.667	8.00	5.667	14.00	8.667	14.00	11.67	12.00
2.683	8.00	5.683	14.00	8.683	14.00	11.68	12.00
2.700	8.00	5.700	14.00	8.700	14.00	11.70	12.00
2.717	8.00	5.717	14.00	8.717	14.00	11.72	12.00
2.733	8.00	5.733	14.00	8.733	14.00	11.73	12.00
2.750	8.00	5.750	14.00	8.750	14.00	11.75	12.00
2.767	8.00	5.767	14.00	8.767	14.00	11.77	12.00
2.783	8.00	5.783	14.00	8.783	14.00	11.78	12.00
2.800	8.00	5.800	14.00	8.800	14.00	11.80	12.00
2.817	8.00	5.817	14.00	8.817	14.00	11.82	12.00
2.833	8.00	5.833	14.00	8.833	14.00	11.83	12.00
2.850	8.00	5.850	14.00	8.850	14.00	11.85	12.00
2.867	8.00	5.867	14.00	8.867	14.00	11.87	12.00
2.883	8.00	5.883	14.00	8.883	14.00	11.88	12.00
2.900	8.00	5.900	14.00	8.900	14.00	11.90	12.00
2.917	8.00	5.917	14.00	8.917	14.00	11.92	12.00
2.933	8.00	5.933	14.00	8.933	14.00	11.93	12.00
2.950	8.00	5.950	14.00	8.950	14.00	11.95	12.00
2.967	8.00	5.967	14.00	8.967	14.00	11.97	12.00
2.983	8.00	5.983	14.00	8.983	14.00	11.98	12.00
3.000	8.00	6.000	14.01	9.000	14.07	12.00	12.00

Unit Hyd Qpeak (cms)= 0.913

PEAK FLOW (cms)= 0.258 (i)  
 TIME TO PEAK (hrs)= 10.000  
 RUNOFF VOLUME (mm)= 115.150  
 TOTAL RAINFALL (mm)= 212.001  
 RUNOFF COEFFICIENT = 0.543

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

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The VO model output shows that the Regional storm peak flow for the external area is 0.258 cms. The 100-year flow calculated in the storm sewer design sheet for the external drainage area is 0.451 cms. Therefore, the 100-year storm event is the governing Regulatory Storm event for this drainage area. The storm sewer system has been sized to capture and convey this 100-year flow from the external area.

**APPENDIX D**  
**LID Design**



Site Description

<b>Total Site Area</b>	<b>3.62</b>	<b>Ha</b>
Proposed Development Area	2.64	Ha
LSRCA Buffer + Woodlot	0.98	Ha

General Infiltration Requirements

Total Mixed Impervious Surface Area (0.75 coefficient)	20100.0	m <sup>2</sup>
Total Roof Impervious Area (0.85 coefficient)	6300.0	m <sup>2</sup>
Total Site Impervious Area	20430.0	m <sup>2</sup>

Storm to Infiltrate	40	mm
Total Site Volume to Infiltrate	<b>817.20</b>	m <sup>3</sup>

Proposed Infiltration

LID ID	LID Unit Name	Downstream LID Unit	Capture Area Ha	Impervious Area m <sup>2</sup>	Required Infiltration Volume m <sup>3</sup>	Depth m	Volume Infiltrated Per Reach m <sup>3</sup>	Proposed LID Infiltration Volume m <sup>3</sup>	Drain Down Time Hours
RY1	Rear Yard LID #1	Perforated Pipe #2	0.14	1050.0	42.0	1.0	42.0	62.21	36.0
PP0	Perforated Pipe #0	Perforated Pipe #1	0.03	255.0	10.2	1.4	10.2	11.61	48.0
PP1	Perforated Pipe #1	Perforated Pipe #2	0.03	255.0	10.2	0.7	10.2	13.55	24.0
PP2	Perforated Pipe #2	Perforated Pipe #3	0.11	935.0	37.4	1.4	37.4	40.92	48.0
RY6	Rear Yard LID #6	Perforated Pipe #3	0.29	2175.0	87.0	1.4	85.2	85.16	48.0
PP3	Perforated Pipe #3	Storm Chamber 2 (a+b)	0.63	4965.0	198.6	1.4	61.6	61.60	48.0
RY2	Rear Yard LID #2	Perforated Pipe #3	0.30	2250.0	90.0	0.7	90.0	91.79	24.0
RY3	Rear Yard LID #3	N/A	0.11	825.0	33.0	0.7	33.0	33.18	24.0
RY5	Rear Yard LID #5	Perforated Pipe #6	0.08	600.0	24.0	0.7	16.9	16.87	24.0
PP6	Perforated Pipe #6	Storm Chamber 3	0.21	1675.0	67.0	0.7	22.4	22.39	24.0
ST3	Storm Chamber 3	Perforated Pipe #7	0.02	170.0	6.8	1.3	58.5	76.80	45.1
RY4	Rear Yard LID #4	Perforated Pipe #7	0.06	450.0	18.0	1.0	18.0	20.74	36.0
PP7	Perforated Pipe #7	Storm Chamber 2 (a+b)	0.37	2875.0	115.0	1.4	47.3	47.28	48.0
ST2	Storm Chamber 2 (a+b)	Storm Chamber 1	0.26	1950.0	78.0	1.3	115.9	115.86	45.1
ST1	Storm Chamber 1	N/A	0.00	0.0	0.0	1.3	168.7	170.04	45.1
<b>TOTAL</b>			<b>2.64</b>	<b>2.04</b>	<b>817.20</b>	<b>TOTAL</b>	<b>817.20</b>	<b>869.99</b>	

Infiltration Summary

Total Site Volume Required to Infiltrate	817	m <sup>3</sup>
Infiltration Volume Provided	870	m <sup>3</sup>
Infiltration Volume Achieved	817	m <sup>3</sup>
<b>Remaining Volume Required</b>	<b>0.0</b>	<b>m<sup>3</sup></b>

Perforated Pipe #0  
*Infiltration Requirements*

<i>LID capture area:</i>	0.03	Ha
Total area of imperviousness	255.0	m <sup>2</sup>
Volume to infiltrate:	40.0	mm
Target Volume to be infiltrated:	10.2	m <sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$

Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 48.0$  detention time (48 hours)

$d = 1.38$

$A = \frac{1000 V}{Pnt}$

Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 10.2$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 48.0$  detention time (48 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A = 18.4**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>21.00 m<sup>2</sup></b>
Depth of clearstone	1.38 m
<b>Trench Volume</b>	<b>29.03 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>11.61 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00 m<sup>3</sup></b>
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Perforated Pipe #1  
Infiltration Requirements

**Volume to be infiltrated from Upstream Source:** 0.0 m<sup>3</sup>

LID capture area: 0.03 Ha  
Total area of imperviousness: 255.0 m<sup>2</sup>  
Volume to infiltrate: 40.0 mm  
Target Volume to be infiltrated: 10.2 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration:** 10.2 m<sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$   
Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 24.0$  detention time (24 hours)  
 $d = 0.69$

$A = \frac{1000 V}{Pnt}$   
Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 10.2$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 24.0$  detention time (24 hours)

$P = K / f.s.$

$K = 72 \text{ mm/hr}$  infiltration rate

$f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

$$A = 36.9$$

**Area Available for Infiltration**

<b>Contact Area</b>	<b>49.00 m<sup>2</sup></b>
Depth of clearstone	0.69 m
<b>Trench Volume</b>	<b>33.87 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>13.55 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00 m<sup>3</sup></b>
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Rear Yard LID #1  
*Infiltration Requirements*

<i>LID capture area:</i>	0.14	Ha
Total area of imperviousness:	1050.0	m <sup>2</sup>
Volume to infiltrate:	40.0	mm
Target Volume to be infiltrated:	42.0	m <sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$

Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 36.0$  detention time (36 hours)

$d = 1.04$

$A = \frac{1000 V}{Pnt}$

Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 42.0$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 36.0$  detention time (36 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A = 101.3**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>150.00 m<sup>2</sup></b>
Depth of clearstone	1.04 m
<b>Trench Volume</b>	<b>155.52 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>62.21 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00 m<sup>3</sup></b>
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Perforated Pipe #2  
 Infiltration Requirements

**Volume to be infiltrated from Upstream Source: 0.0 m<sup>3</sup>**

*LID capture area:* 0.11 Ha  
 Total area of imperviousness 935.0 m<sup>2</sup>  
 Volume to infiltrate: 40.0 mm  
 Reach Volume to be infiltrated: 37.4 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration: 37.4 m<sup>3</sup>**

Maximum clearstone depth:  $d = \frac{PT}{1000}$   
 Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 48.0$  detention time (48 hours)  
 $d = 1.38$

$A = \frac{1000 V}{Pnt}$   
 Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 37.4$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 48.0$  detention time (48 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A = 67.6**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>74.00 m<sup>2</sup></b>
Depth of clearstone	1.38 m
<b>Trench Volume</b>	<b>102.30 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>40.92 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00</b>	<b>m<sup>3</sup></b>
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Rear Yard LID #6  
*Infiltration Requirements*

<i>LID capture area:</i>	0.29	Ha
Total area of imperviousness	2175.0	m <sup>2</sup>
Volume to infiltrate:	40.0	mm
Reach Volume to be infiltrated:	87.0	m <sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$

Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 48.0$  detention time (48 hours)

$d = 1.38$

$A = \frac{1000 V}{Pnt}$

Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 87.0$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 48.0$  detention time (48 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A = 157.3**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>154.00 m<sup>2</sup></b>
Depth of clearstone	1.38 m
<b>Trench Volume</b>	<b>212.89 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>85.16 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>1.84 m<sup>3</sup></b>
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Rear Yard LID #2  
*Infiltration Requirements*

<i>LID capture area:</i>	0.30	Ha
Total area of imperviousness	2250.0	m <sup>2</sup>
Volume to infiltrate:	40.0	mm
Target Volume to be infiltrated:	90.0	m <sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$

Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 24.0$  detention time (24 hours)

$d = 0.69$

$A = \frac{1000 V}{Pnt}$

Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 90.0$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 24.0$  detention time (24 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A = 325.5**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>332.00 m<sup>2</sup></b>
Depth of clearstone	0.69 m
<b>Trench Volume</b>	<b>229.48 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>91.79 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00 m<sup>3</sup></b>
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Perforated Pipe #3  
*Infiltration Requirements*

**Volume to be infiltrated from Upstream Source: 1.8 m<sup>3</sup>**

*LID capture area:* 0.63 Ha  
 Total area of imperviousness 4965.00 m<sup>2</sup>  
 Volume to infiltrate: 40.0 mm  
 Volume to be infiltrated: 198.6 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration: 200.4 m<sup>3</sup>**

Maximum clearstone depth:  $d = \frac{PT}{1000}$   
 Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 48.0$  detention time (48 hours)  
 $d = 1.38$

$A = \frac{1000 V}{Pnt}$   
 Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 200.4$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 48.0$  detention time (48 hours)  
 P=K/f.s.  
 K = 72mm/hr infiltration rate  
 f.s.= 2.5

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A= 362.5**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>111.40 m<sup>2</sup></b>
Depth of clearstone	1.38 m
<b>Trench Volume</b>	<b>154.00 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>61.60 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>138.84 m<sup>3</sup></b>
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Rear Yard LID #3  
*Infiltration Requirements*

<i>LID capture area:</i>	0.11	Ha
Total area of imperviousness	825.0	m <sup>2</sup>
Volume to infiltrate:	40.0	mm
Target Volume to be infiltrated:	33.0	m <sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$

Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 24.0$  detention time (24 hours)

$d = 0.69$

$A = \frac{1000 V}{Pnt}$

Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 33.0$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 24.0$  detention time (24 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A = 119.4**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>120.00 m<sup>2</sup></b>
Depth of clearstone	0.69 m
<b>Trench Volume</b>	<b>82.94 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>33.18 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00 m<sup>3</sup></b>
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Rear Yard LID #5  
*Infiltration Requirements*

<i>LID capture area:</i>	0.08	Ha
Total area of imperviousness	600.0	m <sup>2</sup>
Volume to infiltrate:	40.0	mm
Target Volume to be infiltrated:	24.0	m <sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$

Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 24.0$  detention time (24 hours)

$d = 0.69$

$A = \frac{1000 V}{Pnt}$

Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 24.0$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 24.0$  detention time (24 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A = 86.8**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>61.00 m<sup>2</sup></b>
Depth of clearstone	0.69 m
<b>Trench Volume</b>	<b>42.16 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>16.87 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>7.13 m<sup>3</sup></b>
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Perforated Pipe #6  
*Infiltration Requirements*

**Volume to be infiltrated from Upstream Source:** 7.1 m<sup>3</sup>

*LID capture area:* 0.21 Ha  
 Total area of imperviousness 1675.0 m<sup>2</sup>  
 Volume to infiltrate: 40.0 mm  
 Volume to be infiltrated: 67.0 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration:** 74.1 m<sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$   
 Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 24.0$  detention time (24 hours)  
 $d = 0.69$

$A = \frac{1000 V}{Pnt}$   
 Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 74.1$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 24.0$  detention time (24 hours)

P=K/f.s.  
 K = 72mm/hr infiltration rate  
 f.s.= 2.5

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A= 268.1**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>81.00 m<sup>2</sup></b>
Depth of clearstone	0.69 m
<b>Trench Volume</b>	<b>55.99 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>22.39 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>51.74 m<sup>3</sup></b>
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Storm Chamber 3  
*Infiltration Requirements*

**Volume to be infiltrated from Upstream Source:** **51.74** **m<sup>3</sup>**

*LID capture area:* 0.02 Ha  
 Total area of imperviousness 170.0 m<sup>2</sup>  
 Volume to infiltrate: 40.0 mm  
 Volume to be infiltrated: 6.8 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration:** **58.5** **m<sup>3</sup>**

Drain Down Time:  $T = \frac{1000d}{P}$

Where **P=** 28.8 percolation rate of native soil (mm/h)  
**d=** 1.30 (m)

P=K/f.s.

K = 72mm/hr infiltration rate

f.s.= 2.5

**T=** 45.14 detention time (Hours)

**Area Available for Infiltration**

<b>Contact Area</b>	<b>147.70 m<sup>2</sup></b>
Depth of clearstone	1.30 m
<b>Trench Volume</b>	<b>192.01 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>76.80 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00</b>	<b>m<sup>3</sup></b>
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Rear Yard LID #4  
*Infiltration Requirements*

<i>LID capture area:</i>	0.06	Ha
Total area of imperviousness	450.0	m <sup>2</sup>
Volume to infiltrate:	40.0	mm
Target Volume to be infiltrated:	18.0	m <sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$

Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 36.0$  detention time (36 hours)

$d = 1.04$

$A = \frac{1000 V}{Pnt}$

Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 18.0$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 36.0$  detention time (36 hours)

$P = K/f.s.$   
 $K = 72\text{mm/hr}$  infiltration rate  
 $f.s. = 2.5$

$$A = \frac{(1000)(12.5)}{(28.8)(0.4)(36.0)}$$

**A = 43.4**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>50.00 m<sup>2</sup></b>
Depth of clearstone	1.04 m
<b>Trench Volume</b>	<b>51.84 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>20.74 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00 m<sup>3</sup></b>
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Perforated Pipe #7  
 Infiltration Requirements

**Volume to be infiltrated from Upstream Source:** 0.0 m<sup>3</sup>

*LID capture area:* 0.37 Ha  
 Total area of imperviousness 2875.0 m<sup>2</sup>  
 Volume to infiltrate: 40.0 mm  
 Volume to be infiltrated: 115.0 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration:** 115.0 m<sup>3</sup>

Maximum clearstone depth:  $d = \frac{PT}{1000}$   
 Where  $P = 28.8$  percolation rate of native soil (mm/h)  
 $T = 48.0$  detention time (48 hours)  
 $d = 1.38$

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$A = \frac{1000 V}{Pnt}$   
 Where  $A =$  Bottom area of trench (m<sup>2</sup>)  
 $V = 115.0$  runoff volume to be infiltrated (m<sup>3</sup>)  
 $P = 28.8$  percolation rate of native soil (mm/h)  
 $n = 0.4$  porosity of storage media (0.4 for clear stone)  
 $t = 48.0$  detention time (48 hours)

P=K/f.s.  
 K = 72mm/hr infiltration rate  
 f.s.= 2.5

$$A = \frac{(1000)(12.5)}{(12.0)(0.4)(72.0)}$$

**A= 208.0**

**Area Available for Infiltration**

<b>Contact Area</b>	<b>85.50 m<sup>2</sup></b>
Depth of clearstone	1.38 m
<b>Trench Volume</b>	<b>118.20 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>47.28 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>67.72 m<sup>3</sup></b>
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Storm Chamber 2 (a+b)  
*Infiltration Requirements*

**Volume to be infiltrated from Upstream Source:** **206.57** **m<sup>3</sup>**

*LID capture area:* 0.26 Ha  
 Total area of imperviousness 1950.0 m<sup>2</sup>  
 Volume to infiltrate: 40.0 mm  
 Volume to be infiltrated: 78.0 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration:** **284.6** **m<sup>3</sup>**

Drain Down Time:  $T = \frac{1000d}{P}$

Where **P=** 28.8 percolation rate of native soil (mm/h)  
**d=** 1.30 (m)

$P=K/f.s.$   
 K = 72mm/hr infiltration rate **T=** 45.14 detention time (Hours)  
 f.s.= 2.5

**Area Available for Infiltration**

<b>Contact Area</b>	<b>222.80 m<sup>2</sup></b>
Depth of clearstone	1.30 m
<b>Trench Volume</b>	<b>289.64 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>115.86 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>168.71</b>	<b>m<sup>3</sup></b>
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Storm Chamber 1  
*Infiltration Requirements*

**Volume to be infiltrated from Upstream Source:** **168.71** **m<sup>3</sup>**

*LID capture area:* 0.00 Ha  
 Total area of imperviousness 0.0 m<sup>2</sup>  
 Volume to infiltrate: 40.0 mm  
 Volume to be infiltrated: 0.0 m<sup>3</sup>

**Total Target Volume Required for LID Infiltration:** **168.7** **m<sup>3</sup>**

Drain Down Time:  $T = \frac{1000d}{P}$

Where **P=** 28.8 percolation rate of native soil (mm/h)  
**d=** 1.3 (m)

$P=K/f.s.$   
 K = 72mm/hr infiltration rate **T=** 45.14 detention time (Hours)  
 f.s.= 2.5

**Area Available for Infiltration**

<b>Contact Area</b>	<b>327.00 m<sup>2</sup></b>
Depth of clearstone	1.30 m
<b>Trench Volume</b>	<b>425.10 m<sup>3</sup></b>
Void ratio	0.4
<b>Total LID Infiltration Volume Available</b>	<b>170.04 m<sup>3</sup></b>

<b>Total Imperviousness to be infiltrated in downstream LID</b>	<b>0.00</b>	<b>m<sup>3</sup></b>
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**APPENDIX E**  
**Stormwater Quantity Control Design**

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Reach St. Uxbridge

Quantity Control Analysis - Extended Rational Method

Storm Intensity Curve	2-year	5-year	25-year	100-year
A	645.0	904.000	1234	1799
B	5	5.0	4	5
C	0.786	0.788	0.787	0.81
Intensity (mm/hr)	76.76	107.01	154.64	200.63

Time of Concentration = 10.000 min

Proposed

	Area (ha)	Runoff Coefficient
Development Capture	2.56	0.75
Preserved Woodlot	0.83	0.25
External Area	1.44	0.25
<b>Total Capture Area</b>	<b>4.83</b>	<b>0.51</b>

Storm Intensity Curve	2-year	5-year	25-year	100-year
Proposed Uncontrolled Flow (m <sup>3</sup> /s)	0.53	0.74	1.07	1.39

	5 yr (m3/s)	100 yr (m3/s)
Allowable Target Discharge	0.221	0.414

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Reach St. Uxbridge

Quantity Control Analysis - Extended Rational Method

ENTRY TIME: 10.0 min

TIME STEP 0.5 min

100 yr Post Storm - 100 yr Allowable Discharge					
TIME	INTENSITY (mm/hr)	PEAK DISCHARGE (m <sup>3</sup> /s)	RUNOFF VOLUME (m <sup>3</sup> )	RELEASE VOLUME (m <sup>3</sup> )	STORAGE VOLUME (m <sup>3</sup> )
10.0	200.6	1.387	832.2	248.4	583.8
10.5	195.4	1.351	850.9	260.8	590.1
11.0	190.4	1.316	868.8	273.2	595.6
11.5	185.7	1.284	885.9	285.7	600.3
12.0	181.3	1.253	902.4	298.1	604.3
12.5	177.1	1.224	918.2	310.5	607.7
13.0	173.1	1.197	933.3	322.9	610.4
13.5	169.3	1.170	948.0	335.3	612.6
14.0	165.7	1.145	962.1	347.8	614.3
14.5	162.2	1.121	975.7	360.2	615.5
15.0	158.9	1.099	988.8	372.6	616.2
15.5	155.8	1.077	1001.6	385.0	616.5
16.0	152.8	1.056	1013.9	397.4	616.5
16.5	149.9	1.036	1025.8	409.9	616.0
17.0	147.1	1.017	1037.4	422.3	615.1
17.5	144.5	0.999	1048.7	434.7	614.0
18.0	141.9	0.981	1059.6	447.1	612.5
18.5	139.5	0.964	1070.2	459.5	610.7
19.0	137.1	0.948	1080.6	472.0	608.6
19.5	134.8	0.932	1090.6	484.4	606.3
20.0	132.6	0.917	1100.4	496.8	603.6

THEREFORE THE MAXIMUM VOLUME REQUIRED = 617 m<sup>3</sup>  
TIME DURATION REQUIRED TO OBTAIN MAXIMUM STORAGE = 15.5 min

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Reach St. Uxbridge

Quantity Control Analysis - Extended Rational Method

ENTRY TIME: 10.0 min

TIME STEP 0.5 min

5 yr Post Storm - 5 yr Allowable Discharge					
TIME	INTENSITY (mm/hr)	PEAK DISCHARGE (m <sup>3</sup> /s)	RUNOFF VOLUME (m <sup>3</sup> )	RELEASE VOLUME (m <sup>3</sup> )	STORAGE VOLUME (m <sup>3</sup> )
10.0	107.0	0.740	443.9	132.6	311.3
10.5	104.3	0.721	454.2	139.2	314.9
11.0	101.7	0.703	464.0	145.9	318.2
11.5	99.3	0.686	473.5	152.5	321.0
12.0	97.0	0.670	482.6	159.1	323.5
12.5	94.8	0.655	491.4	165.8	325.6
13.0	92.7	0.641	499.8	172.4	327.4
13.5	90.7	0.627	507.9	179.0	328.9
14.0	88.8	0.614	515.8	185.6	330.2
14.5	87.0	0.602	523.4	192.3	331.1
15.0	85.3	0.590	530.7	198.9	331.8
15.5	83.7	0.578	537.9	205.5	332.3
16.0	82.1	0.567	544.8	212.2	332.6
16.5	80.6	0.557	551.5	218.8	332.7
17.0	79.1	0.547	558.0	225.4	332.6
17.5	77.7	0.537	564.3	232.1	332.3
18.0	76.4	0.528	570.5	238.7	331.8
18.5	75.1	0.519	576.5	245.3	331.2
19.0	73.9	0.511	582.3	251.9	330.4
19.5	72.7	0.503	588.0	258.6	329.4
20.0	71.5	0.495	593.6	265.2	328.4

THEREFORE THE MAXIMUM VOLUME REQUIRED = 333 m<sup>3</sup>  
TIME DURATION REQUIRED TO OBTAIN MAXIMUM STORAGE = 16.5 min

**17:386**

**17:386**

**Reach St. Uxbridge**

**Quantity Control Analysis Approach Summary**

In order to control the proposed sites storm water quantity as per required, three systems will be used in conjunction:

- StormTech Chamber systems to store the majority of the quantity as per required.
- The proposed storm sewer system pipes for additional storage.
- Orifice plates on the downstream manhole to restrict the flow to the allowable release rate and backup the excess flow into the upstream storage system (previous systems mentioned).

17:386

Reach St. Uxbridge

Quantity Control Analysis - Storage Volume Calculation

*Quantity Control Requirement*

MAXIMUM VOLUME REQUIRED		
100 yr Post Storm - 100 yr Allowable Discharge	617	m3
5 yr Post Storm - 5 yr Allowable Discharge	333	m3
<b>Max storage Required=</b>	<b>617</b>	<b>m3</b>

*Proposed Quantity Control Measures*

Storm Water Top Storage Elevation = 279.30 m

<b>StormTech Chamber Storage Unit:</b>	1	2	3
Total Chamber Storage	460	322	192
Retention Quantity	160	115	79
Active Quantity	300	208	114
<b>Storm Chamber Quantity Control Storage</b>	<b>300</b>	<b>208</b>	<b>114</b>

Total Chamber Storage available = 621 m<sup>3</sup>

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Reach St. Uxbridge

Quantity Control Analysis

Maintenance Hole Storage														
Manhole Number	MH24	MH23	MH22	MH21	MH20	MH19	MH18	MH17	MH16	MH15	MH14	MH13	MH12	CBMH11
Manhole Diameter (mm)	1500	1500	1500	1200	1500	1500	1800	1500	1500	1500	1200	1200	1200	1200
Downstream Invert Elevation (m)	277.46	277.64	277.67	277.61	277.76	277.78	277.90	278.12	278.22	278.38	278.40	278.54	278.69	278.90
Depth of Storage (m)	1.8	1.7	1.6	1.7	1.5	1.5	1.4	1.2	1.1	0.9	0.9	0.8	0.6	0.4
Storage Volume (m <sup>3</sup> )	3.25	2.93	2.88	1.91	2.72	2.68	3.56	2.08	1.91	1.62	1.02	0.86	0.69	0.45

Total Manhole Storage available = 28.57 m<sup>3</sup>

Pipe Storage															
MH ID	Diameter	D (m)	DS Inv	Raw Depth	Depth	US Inv	Raw Depth	Depth	Avg Depth	r	h	Theta (rad)	Area at Depth	Pipe Length	Volume
MH24-23	525	0.525	277.51	0.525	0.525	277.71	0.525	0.525	0.525	0.000	0.000	0.000	0.216	33.5	7.25
MH23-22	525	0.525	277.66	0.525	0.525	277.67	0.525	0.525	0.525	0.000	0.000	0.000	0.216	4.8	1.04
MH19-18	675	0.675	277.80	0.675	0.675	277.90	0.675	0.675	0.675	0.000	0.000	0.000	0.358	6.1	2.18
MH18-7	600	0.600	277.92	0.600	0.600	279.60	-0.300	0.000	0.300	0.000	0.300	3.142	0.141	37.0	5.23
MH18-17	675	0.675	277.98	0.675	0.675	278.12	0.675	0.675	0.675	0.000	0.000	0.000	0.358	69.1	24.73
MH17-16	600	0.600	278.19	0.600	0.600	278.22	0.600	0.600	0.600	0.000	0.000	0.000	0.283	11.1	3.14
MH16-MH15	525	0.525	278.37	0.525	0.525	278.38	0.525	0.525	0.525	0.000	0.000	0.000	0.216	7.7	1.67
MH14-MH13	450	0.450	278.42	0.450	0.450	278.54	0.450	0.450	0.450	0.000	0.000	0.000	0.159	39.7	6.31
MH13-MH12	375	0.375	278.62	0.375	0.375	278.69	0.375	0.375	0.375	0.000	0.000	0.000	0.110	16.4	1.81
MH12-CBMH11	300	0.300	278.77	0.300	0.300	278.90	0.300	0.300	0.300	0.000	0.000	0.000	0.071	31.7	2.24

Total Pipe Storage Available = 55.60 m<sup>3</sup>

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Reach St. Uxbridge

Quantity Control Analysis

*Summary of Quantity Control Measures*

<b>Quantity Control Required</b>	<b>616.5</b>	<b>m3</b>
Proposed Storm Chamber Storage	620.9	m3
Proposed Manhole Storage	28.57	m3
Proposed Pipe Storage	55.60	m3
<b>Total Proposed Storage Volume</b>	<b>705.05</b>	<b>m3</b>



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Quantity Control Analysis - Orifice Sizing

**ORIFICE 1: 5 YEAR STORM VERTICAL ORIFICE PLATE**

<b>Max Allowable Flow</b>	<b>0.221</b>	m <sup>3</sup> /s
<b>H<sub>max</sub></b>	278.24	m
<b>Pipe Invert (Orifice #1 Inv)</b>	277.46	m
<b>C</b>	0.62	
<b>Head</b>	0.67	m
<b>Orifice #1 Diameter</b>	<b>219</b>	<b>mm</b>

$$Q = CA\sqrt{2gh}$$

$$Q = \left( 0.620 \left[ 0.038 \right] \left[ 2 \times 9.81 \times 0.67 \text{ m} \right] \right)$$

$$Q = 0.085 \text{ m}^3/\text{s}$$

The design 5-year flow is less than the allowable, therefore the Orifice 1 sizing is acceptable.

**ORIFICE 2: 100 YEAR STORM VERTICAL ORIFICE PLATE**

**Flow Released through Orifice 1 at 100 Year Ponding Elevation:**

<b>H<sub>max</sub></b>	279.30	m
<b>Pipe Invert (Orifice #1 Inv)</b>	277.46	m
<b>C</b>	0.62	
<b>Head</b>	1.73	m
<b>Diameter</b>	<b>219</b>	<b>mm</b>

$$Q = CA\sqrt{2gh}$$

$$Q = \left( 0.620 \left[ 0.038 \right] \left[ 2 \times 9.81 \times 1.73 \text{ m} \right] \right)$$

$$Q = 0.136 \text{ m}^3/\text{s}$$

<b>Max Total Allowable Flow</b>	0.414	m <sup>3</sup> /s
<b>5 Year Control Orifice Flow</b>	0.136	m <sup>3</sup> /s
<b>Remaining 100-Year Allowable Flow</b>	0.278	m <sup>3</sup> /s
<b>Orifice #2 Inv</b>	278.24	m
<b>Head</b>	0.87	m
<b>Orifice #2 Diameter</b>	<b>371</b>	<b>mm</b>

$$Q = \left( 0.620 \left[ 0.108 \right] \left[ 2 \times 9.81 \times 0.87 \text{ m} \right] \right)$$

$$Q = 0.278 \text{ m}^3/\text{s}$$

The design 100-year flow is equal to the allowable, therefore the Orifice 1 and 2 sizing is acceptable.

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Reach St. Uxbridge

Quantity Control Analysis - Storage-Discharge Curve for VO

Orifice Plates/Tubes		Orifice 1	Orifice 2		
Diameter (m)		0.219	0.371		
Invert (m)		277.46	278.24		
Sill Elevation (m)					
Sill @					
Length (m)		N/A	N/A		
Coefficient, C		0.62	0.62		
Volume (m <sup>3</sup> )	Elevation (m)	Orifice Plate Flow	Orifice Plate Flow (m <sup>3</sup> /s)	Total Orifice Flow	
0	277.46	0.000	0.000	0.000	
0.35	277.61	0.019	0.000	0.019	
22.45	277.71	0.039	0.000	0.039	
123.29	277.96	0.065	0.000	0.065	
145.83	278.02	0.069	0.000	0.069	
242.00	278.24	0.085	0.000	0.085	
243.69	278.25	0.085	0.001	0.086	
359.15	278.46	0.098	0.057	0.154	
406.94	278.55	0.102	0.095	0.197	
485.95	278.71	0.110	0.158	0.269	
592.58	278.96	0.122	0.217	0.339	
636.04	279.08	0.127	0.240	0.367	
652.14	279.13	0.129	0.249	0.378	
668.03	279.18	0.131	0.258	0.389	
684.01	279.23	0.133	0.266	0.400	
705.05	279.30	0.136	0.278	0.414	

**Weir Flow**

$$Q = CLH^{\frac{3}{2}}$$

Where:

C = Weir coefficient

L = Length of grate

H = Head above the weir

**Orifice Flow**

$$Q = CA\sqrt{2gh}$$

Where:

C = Orifice Coefficient

A = Crosssectional area

g = 9.81 m/s<sup>2</sup>

h = Head above mid point

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Reach St. Uxbridge

Quantity Control Analysis - Hydrology Model Output Summary

On-site Storage

Storm Event	Retention Volume		Quantity Storage	
	Storage Used	Peak Flow	Storage Used	Peak Flow
	(m <sup>3</sup> )	(m <sup>3</sup> /s)	(m <sup>3</sup> )	(m <sup>3</sup> /s)
5 Year	870.0	0.01	0.1	0.01
25 Year	870.0	0.11	54.0	0.05
50 Year	870.0	0.22	136.0	0.07
100 Year	870.0	0.41	242.0	0.09

Downstream Pond

Storm Event	Pre-Development	"Ultimate" Model (Burnside)		"Ultimate" Model (SKA)		Proposed Post Development Model (SKA)	
	Peak Flow	Volume	Peak Flow	Volume	Peak Flow	Volume	Peak Flow
	(m <sup>3</sup> /s)	(m <sup>3</sup> )	(m <sup>3</sup> /s)	(m <sup>3</sup> )	(m <sup>3</sup> /s)	(m <sup>3</sup> )	(m <sup>3</sup> /s)
5 Year	0.35	3,757	0.16	3,746	0.16	3,679	0.14
25 Year	0.62	4,946	0.50	4,958	0.50	4,914	0.48
50 Year	0.74	5,416	0.67	5,439	0.68	5,404	0.66
100 Year	0.88	5,912	0.86	5,959	0.87	5,925	0.85

Therefore, since the proposed design results in less storage required than calculated using the Rational Method, and results in the downstream SWM pond volume and peak flow targets being maintained, the provided quantity control are appropriate.

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Reach St. Uxbridge

Quantity Control Analysis - Chamber Stage-Storage Summary

Chamber 1

Elevation	Volume
277.61	0.00
277.71	21.44
277.96	76.40
278.02	88.08
278.25	136.22
278.46	177.73
278.55	194.34
278.71	222.08
278.96	260.09
279.08	274.66
279.13	280.40
279.18	286.13
279.23	291.86
279.30	299.51

Chamber 2A

Elevation	Volume
-	-
277.71	0.00
277.96	22.95
278.02	28.05
278.25	47.35
278.46	64.50
278.55	71.76
278.71	83.79
278.96	100.45
279.08	107.42
279.13	110.01
279.18	112.52
279.23	114.77
279.30	118.05

Chamber 2B

Elevation	Volume
-	-
277.71	0.00
277.96	17.86
278.02	21.82
278.25	36.77
278.46	49.99
278.55	55.57
278.71	64.75
278.96	77.29
279.08	82.16
279.13	84.01
279.18	85.77
279.23	87.48
279.30	89.77

Chamber 3

Elevation	Volume
-	-
-	-
-	-
-	-
278.25	0.00
278.46	24.91
278.55	35.13
278.71	52.80
278.96	79.82
279.08	92.86
279.13	97.48
279.18	102.44
279.23	107.29
279.30	113.55

\*Volume is calculated by taking the total volume minus the retention volume provided by Stormtech.

**APPENDIX F**  
**OTTSWMM Capture Analysis**

### **100-Year Capture Analysis**

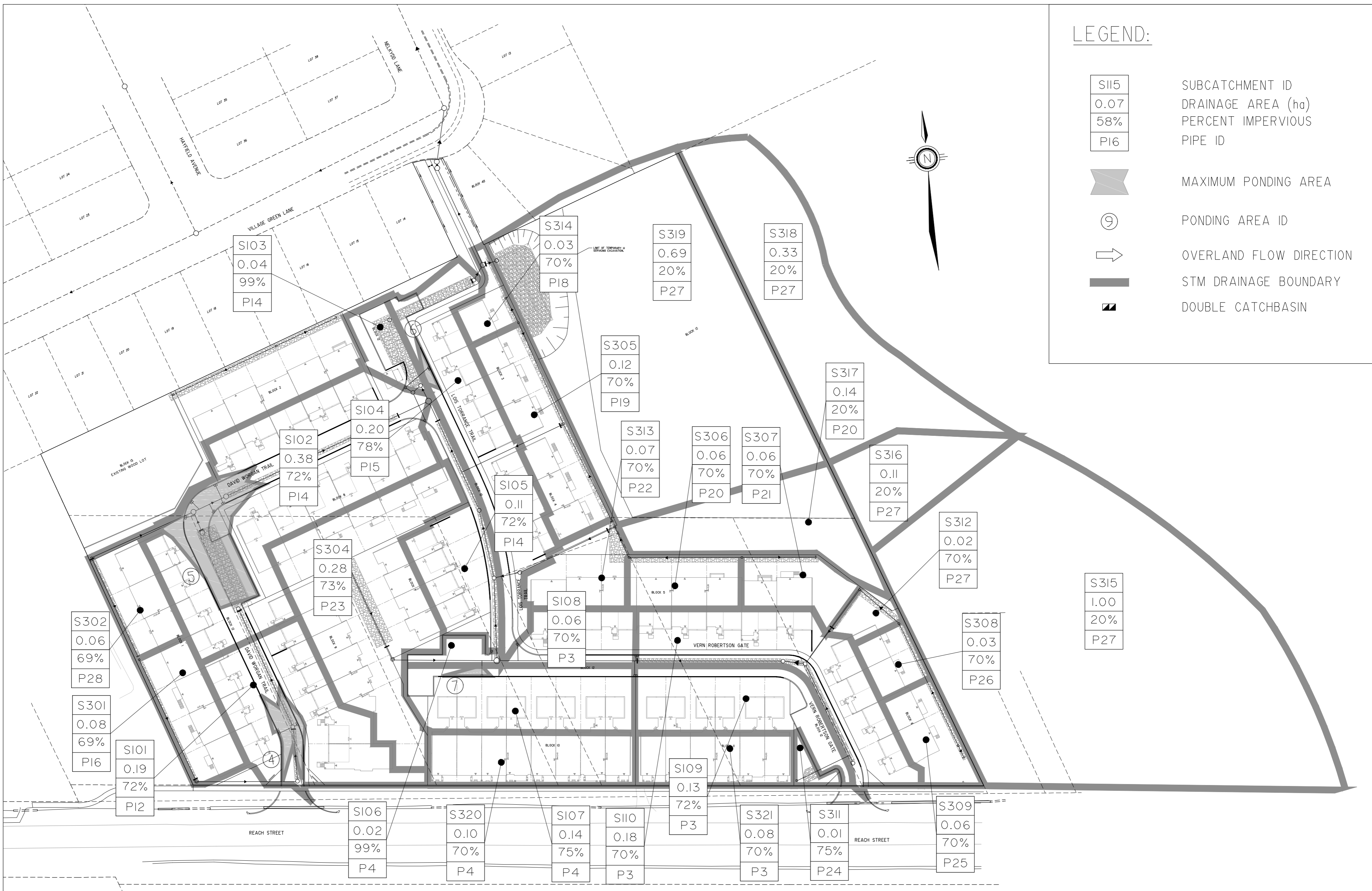
A capture analysis was conducted using OTTSWMM to ensure that the sufficient major system capture points are provided to safely capture the 100-year storm event on-site and convey all flows to the minor system storage. Catchment imperviousness, road grades, pipe slopes, pipe diameter and catchbasin locations have been assigned appropriately based on the proposed design. The following assumptions were made in the development of the model:

- Low points capture capacities were calculated using MTOD Design chart 4.19
- Rear yard catchbasins were assumed to capture incoming flows at a 1:1 capture rate

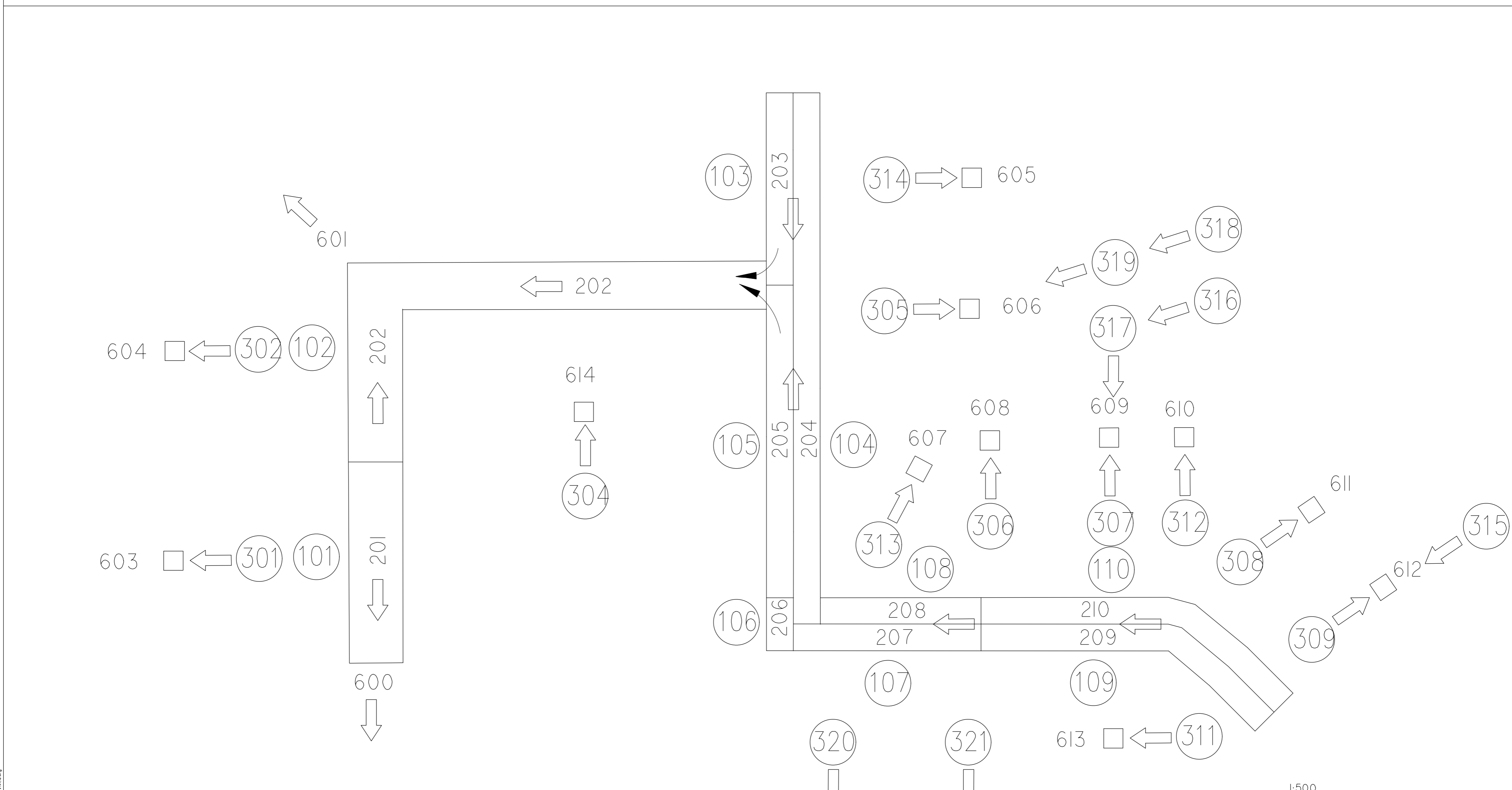
The following section of this Appendix (OTTSWMM Output) shows the model generated output, as well as Manning's calculations for the maximum major system flow the model generated on the flattest road segment (0.5%). As seen in the modelling results, there is no spillage at the low point adjacent to the proposed woodlot at the northwest limit of the site (major system segment 202). Therefore, the system has been sufficiently designed to capture all major system flows under a 100-year storm event and the 100-year flow depth is contained within the curbs.

The following modelling is included:

- VNHGL.in
- VNHGL.ott



### REACH STREET LANDS



1:500

#### LEGEND

- 100: SUBCATCHMENT ID
- 200: STREET SEGMENT ID
- OVERLAND FLOW ROUTE
- GUTTER SPILL DIRECTION
- REAR LOT CATCHBASIN

### REACH STREET LANDS OTTSWMM PLAN



PROJECT NUMBER  
**17:386**

FIGURE NUMBER  
**3**

PLOT DATE: 04/05/2020 1:54 PM CAD FILE: P:\17:386\Ottswmm\ReachStreetLands\_01132020.dwg

P C - O T T S W M M.100

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*****
*
*   Ottawa University Storm Water Management Model   *
*
*****
*
*           For the IBM-PC/XT                       *
*           -----                               *
*
*           Release 1                               *
*           October, 1985                          *
*           *****                               *
*
*   Author:      A. Kassem & P. Wisner             *
*
*   Distributed by: Andrew Brodie Associates Inc.   *
*
*   Licenced to:  Andrew Brodie Associates Inc.    *
*
*****
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DISCLAIMER AND LIMITATION OF LIABILITIES

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PC-OTTSWMM was carefully prepared and tested to ascertain its effectiveness and correctness. However, the program is supplied without expressed or implied warranty of any kind, including any warranty of fitness for a particular purpose.

In no event will the authors or distributor be liable for any damages whether incidental, consequential or direct in connection with or arising from the furnishing, performance or use of the program.

\*\*\*\*\* BASIC PROGRAM LIMITATIONS\*\*\*\*\*

1. MAXIMUM NUMBER OF COMPUTATIONAL TIME STEPS (NDELTC) IN CARD GROUP 1B = 50
2. MAXIMUM NUMBER OF TIME INCREMENTS FOR RAINFALL HYETOGRAPH (NDELTR) IN CARD GROUP 2A = 100
3. MAXIMUM NUMBER OF PIPES, INCLUDING THE NUMBER OF OUTLETS FROM THE MINOR SYSTEM IN CARD GROUP 3B = 100
4. MAXIMUM NUMBER OF STORAGE UNITS FOR MINOR SYSTEM (UNDERGROUND STORAGE) IN CARD GROUP 4 = 5
5. MAXIMUM NUMBER OF STREET SEGMENT TYPES, FOR THE COMPUTATION OF RATING CURVES(NSSEG) IN CARD GROUP 5A = 10
6. MAXIMUM NUMBER OF PAIR OF POINTS (QAPP(J,I), QCAP(J,I)) DEFINING INLET CAPTURE IN CARD GROUP 6C = 10
7. MAXIMUM NUMBER OF STREET SEGMENTS, INCLUDING OUTLETS FROM THE MAJOR SYSTEM IN CARD GROUP 7 = 100
8. MAXIMUM NUMBER OF STORAGE UNITS FOR MAJOR SYSTEM IN CARD GROUP 8 = 5
9. MAXIMUM NUMBER OF SUBCATCHMENTS IN CARD GROUP 9E = 100
10. THERE CAN BE NO MORE THAN 5 UPSTREAM PIPES CONNECTING TO A PIPE JUNCTION.
11. THERE CAN BE NO MORE THAN 5 UPSTREAM STREET SEGMENT CONNECTING TO A STREET JUNCTION.
12. THE MAXIMUM NUMBER OF OUTLETS FROM THE PIPE SYSTEM IS 5 (INCLUDING OUTLETS INTO STORAGES). THERE ARE NO RESTRICTIONS ON THE NUMBER OF OUTLETS FROM THE MAJOR SYSTEM.
13. AN OUTLET FROM THE MINOR SYSTEM (FREE OUTFLOW OR OUTLET INTO STORAGE) CAN BE CONNECTED TO ONLY ONE UPSTREAM PIPE.
14. AN OUTLET FROM THE MAJOR SYSTEM(FREE OUTLET OR OUTLET INTO STORAGES) CAN BE CONNECTED TO ONLY ONE UPSTREAM STREET SEGMENT.
15. THE RATIO BETWEEN THE TIME INCREMENT FOR CALCULATION



- (NDELTC)/TIME INCREMENT OF RAINFALL HYETOGRAPH(NDELTR) SHOULD BE AN INTEGER (GREATER THAN OR EQUAL 1).
16. THE MAXIMUM NUMBER OF POINTS(NJC) DESCRIBING THE INLET CAPTURE CURVE = 50.
  17. THE MAXIMUM NUMBER OF POINTS(NSP1(I)) DESCRIBING THE MINOR SYSTEM STORAGE-DISCHARGE CURVE = 20
  18. THE MAXIMUM NUMBER OF UNIT AREA HYDROGRAPH TYPES(NUAH) = 5

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*****
*
*UNIVERSITY OF OTTAWA STORM WATER MANAGEMENT MODEL*
*
*                   OTTSWMM                               *
*
*****

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100 year Storm-Chicago 4 hour storm

TIME INCREMENT FOR CALCULATION    10.00 MINUTES  
NUMBER OF COMPUTATIONAL STEPS       24  
LIMITING CAPACITY OF INLETS         37.80 L/S  
TOTAL SIMULATION TIME               230.00 MINUTES

PIPE SIZES WILL BE REVISED FOR FREE SURFACE FLOW CONDITIONS

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100 year Storm-Chicago 4 hour storm

RAINFALL DATA

TIME (MIN)	RAINFALL (MM/HR)	RAINFALL INTENSITY (MM/HR)					
		.43E+01	.39E+02	.79E+02	.12E+03	.16E+03	.20E+03
.00	4.96	I	I	I	I	I	I
10.00	5.70	I**					I
20.00	6.76	I**					I
30.00	8.37	I**					I
40.00	11.15	I***					I
50.00	17.24	I****					I
60.00	42.97	I*****					I
70.00	200.60	I*****					I
80.00	56.98	I*****					I
90.00	29.02	I*****					I
100.00	19.60	I****					I
110.00	14.91	I****					I
120.00	12.10	I****					I
130.00	10.22	I***					I
140.00	8.88	I***					I
150.00	7.87	I***					I
160.00	7.08	I**					I
170.00	6.45	I**					I
180.00	5.93	I**					I
190.00	5.49	I**					I
200.00	5.12	I**					I
210.00	4.80	I**					I
220.00	4.52	I**					I
230.00	4.28	I**					I
		I	I	I	I	I	I
		.43E+01	.39E+02	.79E+02	.12E+03	.16E+03	.20E+03

RAINFALL DURATION 240.00 MINUTES

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100 year Storm-Chicago 4 hour storm

MINOR SYSTEM DATA

NO.	SEWER NUMBER	D/S SEWER	LENGTH (M)	SLOPE (M/M)	MANNING (N)	DIAMETER (MM)	DRY WEATHER FLOW (CMS)	STORAGE ID NUMBER	HYDROGRAPH PRINTED
1	1	3	33.200	.020	.013	300.00	.000	0	NO
2	3	6	98.200	.050	.013	375.00	.000	0	NO
3	4	6	27.500	.004	.013	375.00	.000	0	NO
4	6	7	23.400	.005	.013	525.00	.000	0	NO
5	7	8	12.500	.005	.013	525.00	.000	0	NO
6	8	9	16.000	.010	.013	300.00	.000	0	NO
7	9	15	32.500	.030	.013	750.00	.000	0	NO
8	10	11	31.700	.010	.013	375.00	.000	0	NO
9	11	12	16.400	.004	.013	450.00	.000	0	NO
10	12	13	37.100	.003	.013	675.00	.000	0	NO
11	13	14	36.300	.002	.013	675.00	.000	0	NO
12	14	15	80.000	.002	.013	750.00	.000	0	NO
13	15	700	17.800	.010	.013	750.00	.000	0	NO
14	16	10	41.000	.010	.013	300.00	.000	0	NO
15	17	28	33.300	.005	.013	250.00	.000	0	NO
16	18	29	33.300	.005	.013	250.00	.000	0	NO
17	19	22	35.200	.005	.013	250.00	.000	0	NO
18	20	22	10.900	.005	.013	250.00	.000	0	NO
19	21	20	35.000	.005	.013	250.00	.000	0	NO
20	22	7	41.100	.020	.013	300.00	.000	0	NO
21	23	4	34.000	.010	.013	300.00	.000	0	NO
22	24	1	17.800	.010	.013	300.00	.000	0	NO
23	25	26	45.600	.010	.013	300.00	.000	0	NO
24	26	27	15.800	.010	.013	300.00	.000	0	NO
25	27	2	31.000	.036	.013	300.00	.000	0	NO
26	28	14	33.500	.010	.013	300.00	.000	0	NO
27	29	9	35.000	.020	.013	375.00	.000	0	NO
28	30	18	9.400	.005	.013	250.00	.000	0	NO
29	31	21	25.500	.005	.013	250.00	.000	0	NO

TOTAL NUMBER OF PIPES = 29

OUTLETS FROM MINOR SYSTEM

OUTLET NO.

700 FREE FLOW OUTLET  
2 FREE FLOW OUTLET

TOTAL NUMBER OF OUTLETS FROM PIPE SYSTEM = 2

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MAJOR SYSTEM RATING CURVE

NO. OF GEOMETRIES 10

TYPE	PAVEMENT WIDTH (M)	PAVEMENT CROSS SLOPE (M/M)	HEIGHT OF CURB (MM)	MANNING (N)	LONG. SLOPE (M/M)	SHOULDER CROSS SLOPE (M/M)	SHOULDER ROUGHNESS N	MAXIMUM FLOW DEPTH (M)
1	3.250	.020	50.0	.013	.007	.020	.025	.095

RATING CURVE

DEPTH (MM)	FLOW (CMS)	SPREAD (M)
.00	.00	.00
30.48	.02	1.52
60.96	.14	3.05
91.44	.42	5.32

TYPE	PAVEMENT WIDTH (M)	PAVEMENT CROSS SLOPE (M/M)	HEIGHT OF CURB (MM)	MANNING (N)	LONG. SLOPE (M/M)	SHOULDER CROSS SLOPE (M/M)	SHOULDER ROUGHNESS N	MAXIMUM FLOW DEPTH (M)
2	3.250	.020	50.0	.013	.010	.020	.025	.095

RATING CURVE

DEPTH (MM)	FLOW (CMS)	SPREAD (M)
.00	.00	.00
30.48	.03	1.52
60.96	.17	3.05
91.44	.50	5.32

TYPE	PAVEMENT WIDTH (M)	PAVEMENT CROSS SLOPE (M/M)	HEIGHT OF CURB (MM)	MANNING (N)	LONG. SLOPE (M/M)	SHOULDER CROSS SLOPE (M/M)	SHOULDER ROUGHNESS N	MAXIMUM FLOW DEPTH (M)
3	3.250	.020	50.0	.013	.011	.020	.025	.095

RATING CURVE

DEPTH (MM)	FLOW (CMS)	SPREAD (M)
.00	.00	.00
30.48	.03	1.52
60.96	.17	3.05
91.44	.53	5.32

TYPE	PAVEMENT WIDTH (M)	PAVEMENT CROSS SLOPE (M/M)	HEIGHT OF CURB (MM)	MANNING (N)	LONG. SLOPE (M/M)	SHOULDER CROSS SLOPE (M/M)	SHOULDER ROUGHNESS N	MAXIMUM FLOW DEPTH (M)
4	3.250	.020	50.0	.013	.012	.020	.025	.095

RATING CURVE

DEPTH (MM)	FLOW (CMS)	SPREAD (M)
.00	.00	.00
30.48	.03	1.52
60.96	.18	3.05
91.44	.56	5.32

TYPE	PAVEMENT WIDTH (M)	PAVEMENT CROSS SLOPE (M/M)	HEIGHT OF CURB (MM)	MANNING (N)	LONG. SLOPE (M/M)	SHOULDER CROSS SLOPE (M/M)	SHOULDER ROUGHNESS N	MAXIMUM FLOW DEPTH (M)
5	3.250	.020	50.0	.013	.013	.020	.025	.095



9            1.250       .330           .0           .025           .044           .330           .025           .300

RATING CURVE

DEPTH (MM)	FLOW (CMS)	SPREAD (M)
.00	.00	.00
30.48	.00	.09
60.96	.01	.18
91.44	.03	.28
121.92	.07	.37
152.40	.13	.46
182.88	.21	.55
213.36	.31	.65
243.84	.44	.74
274.32	.61	.83

↑

TYPE	PAVEMENT WIDTH (M)	PAVEMENT CROSS SLOPE (M/M)	HEIGHT OF CURB (MM)	MANNING (N)	LONG. SLOPE (M/M)	SHOULDER CROSS SLOPE (M/M)	SHOULDER ROUGHNESS N	MAXIMUM FLOW DEPTH (M)
10	1.250	.330	.0	.025	.020	.330	.025	.300

RATING CURVE

DEPTH (MM)	FLOW (CMS)	SPREAD (M)
.00	.00	.00
30.48	.00	.09
60.96	.01	.18
91.44	.02	.28
121.92	.05	.37
152.40	.09	.46
182.88	.14	.55
213.36	.21	.65
243.84	.30	.74
274.32	.41	.83

↑

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INLET DATA

NO. OF INLET TYPES    3

INLET TYPE            1

NO. OF POINTS       14

APPROCH FLOW (L/S)	INLET FLOW (L/S)
.00	.00
14.10	6.80
28.30	8.80
42.50	12.10
56.70	14.60
85.00	18.50
133.30	21.80
141.60	24.90
170.00	27.60
198.30	29.90
226.60	31.70
255.00	33.70
283.30	36.00
311.60	37.80

↑

INLET TYPE 2

NO. OF POINTS 14

APPROCH FLOW (L/S)	INLET FLOW (L/S)
.00	.00
14.10	13.60
28.30	17.60
42.50	24.10
56.70	29.20
85.00	37.10
133.30	43.60
141.60	49.90
170.00	55.20
198.30	59.80
226.60	63.50
255.00	67.40
283.30	72.00
311.60	75.60

↑

INLET TYPE 3

NO. OF POINTS 8

APPROCH FLOW (L/S)	INLET FLOW (L/S)
.00	.00
28.30	28.30
84.90	84.90
113.20	113.20
141.50	141.50
169.80	169.80
2830.00	2830.00
5660.00	5660.00

↑

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SURFACE PONDING DATA

TYPE	CONSTANT OUTFLOW CFS,L/S	MAXIMUM STORAGE FT3 , L
4	176.00	5533.0
5	418.00	47413.0
6	10.00	475.0
7	19.00	488.0

↑

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MAJOR SYSTEM DATA

NO.	STREET SEGMENT	D/S SEGMENT	LENGTH (M)	TYPE	NO. OF C.B.	INLET TYPE	INLET RESTRIC.	CONNECTING PIPE	STORAGE ID NO.	FLOW HISTORY
1	201	600	30.2	4	2	4	176.00	12	0	YES
2	202	601	78.5	5	2	5	1418.00	14	0	YES
3	203	202	32.2	1	2	1	37.80	14	0	NO
4	204	203	91.3	7	2	6	10.00	15	0	YES
5	205	202	80.9	8	2	1	37.80	14	0	NO
6	206	205	22.9	2	2	1	37.80	4	0	NO
7	207	206	47.2	6	2	7	19.00	4	0	YES
8	208	204	41.8	6	2	1	37.80	3	0	NO
9	209	207	89.9	6	2	1	37.80	3	0	NO
10	210	208	89.6	3	2	1	37.80	3	0	NO
11	401	603	41.4	9	2	3	5660.00	16	0	NO
12	402	604	34.5	10	2	3	5660.00	28	0	NO

13	404	614	59.7	10	2	3	5660.00	23	0	NO
14	405	606	35.2	10	2	3	5660.00	19	0	NO
15	406	608	34.5	9	2	3	5660.00	20	0	NO
16	407	609	39.6	9	2	3	5660.00	21	0	NO
17	408	611	19.5	10	2	3	5660.00	26	0	NO
18	409	612	27.5	10	2	3	5660.00	25	0	NO
19	411	613	13.7	10	2	3	5660.00	24	0	NO
20	412	610	16.3	10	2	3	5660.00	27	0	NO
21	413	607	10.6	10	2	3	5660.00	22	0	NO
22	414	605	25.9	10	2	3	5660.00	18	0	NO
23	415	409	118.1	10	0	0	37.80	25	0	NO
24	416	417	56.5	10	0	0	37.80	21	0	NO
25	417	407	74.5	10	0	0	37.80	21	0	NO
26	418	419	63.0	10	0	0	37.80	19	0	NO
27	419	405	72.5	10	0	0	37.80	19	0	NO
28	420	620	64.0	10	2	3	5660.00	4	0	NO
29	421	621	48.8	10	2	3	5660.00	3	0	NO

TOTAL NUMBER OF STREET SEGMENTS 29

TOTAL LENGTH OF MAJOR SYSTEM 1460.30

OUTLETS FROM MAJOR SYSTEM

OUTLET NO.

- 600 FREE FLOW OUTLET
- 601 FREE FLOW OUTLET
- 603 FREE FLOW OUTLET
- 604 FREE FLOW OUTLET
- 614 FREE FLOW OUTLET
- 606 FREE FLOW OUTLET
- 608 FREE FLOW OUTLET
- 609 FREE FLOW OUTLET
- 611 FREE FLOW OUTLET
- 612 FREE FLOW OUTLET
- 613 FREE FLOW OUTLET
- 610 FREE FLOW OUTLET
- 607 FREE FLOW OUTLET
- 605 FREE FLOW OUTLET
- 620 FREE FLOW OUTLET
- 621 FREE FLOW OUTLET

TOTAL NUMBER OF OUTLETS FROM MAJOR SYSTEM = 16

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SUB-CATCHMENT DATA

MAX. INFILTRATION 76.20 MM./HR.  
MIN. INFILTRATION 13.20 MM./HR.  
DECAY RATE .001150 1/SEC

	SUBAREA NO.	STREET SEGMENT	AREA (HA.)	IMP. (%)	MANNING (N) (IMP.)	MANNING (N) (PERV.)	SLOPE (M/M)	WIDTH (M)	DEP. STOR. IMP. (MM)	DEP. STOR. PERV. (MM)	FLOW HISTORY
1	101	201	.2	71.9	.013	.250	.032	51.	1.570000	4.650000	NO
2	102	202	.4	72.4	.013	.250	.029	152.	1.570000	4.650000	NO
3	103	203	.0	99.0	.013	.250	.013	32.	1.570000	4.650000	NO
4	104	204	.2	77.7	.013	.250	.033	91.	1.570000	4.650000	NO
5	105	205	.1	72.1	.013	.250	.037	81.	1.570000	4.650000	NO
6	106	206	.0	99.0	.013	.250	.010	23.	1.570000	4.650000	NO
7	107	207	.1	75.0	.013	.250	.037	47.	1.570000	4.650000	NO
8	108	208	.1	70.0	.013	.250	.033	42.	1.570000	4.650000	NO
9	109	209	.1	72.4	.013	.250	.034	90.	1.570000	4.650000	NO
10	110	210	.2	70.0	.013	.250	.034	90.	1.570000	4.650000	NO
11	301	401	.1	69.0	.013	.250	.030	41.	1.570000	4.650000	NO
12	302	402	.1	69.0	.013	.250	.020	35.	1.570000	4.650000	NO
13	304	404	.3	72.5	.013	.250	.029	117.	1.570000	4.650000	NO
14	305	405	.1	70.0	.013	.250	.036	35.	1.570000	4.650000	NO
15	306	406	.1	70.0	.013	.250	.050	35.	1.570000	4.650000	NO
16	307	407	.1	70.0	.013	.250	.039	40.	1.570000	4.650000	NO
17	308	408	.0	70.0	.013	.250	.050	20.	1.570000	4.650000	NO
18	309	409	.1	70.0	.013	.250	.038	28.	1.570000	4.650000	NO
19	311	411	.0	75.0	.013	.250	.020	14.	1.570000	4.650000	NO
20	312	412	.0	70.0	.013	.250	.041	16.	1.570000	4.650000	NO

21	313	413	.1	70.0	.013	.250	.025	11.	1.570000	4.650000	NO
22	314	414	.0	70.0	.013	.250	.025	26.	1.570000	4.650000	NO
23	315	415	1.0	20.0	.013	.250	.020	118.	1.570000	4.650000	NO
24	316	416	.1	20.0	.013	.250	.020	57.	1.570000	4.650000	NO
25	317	417	.1	20.0	.013	.250	.020	75.	1.570000	4.650000	NO
26	318	418	.3	20.0	.013	.250	.020	63.	1.570000	4.650000	NO
27	319	419	.7	20.0	.013	.250	.020	73.	1.570000	4.650000	NO
28	320	420	.1	70.0	.013	.250	.020	64.	1.570000	4.650000	NO
29	321	421	.1	70.0	.013	.250	.030	49.	1.570000	4.650000	NO

\* INFLOW HYDROGRAPH INPUT DIRECTLY  
 \*\* INFLOW HYDROGRAPH INPUT DIRECTLY IN TERMS OF FLOW PER UNIT AREA

TOTAL DRAINAGE AREA                    4.75 HECTARES  
 NUMBER OF SUBAREAS                    29  
 TOTAL NUMBER OF INLETS                48  
 DENSITY OF INLETS                    10.11 C.B./HECTARE  
 AVERAGE DISTANCE BETWEEN INLETS    60.85 M

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MAJOR SYSTEM DETAILED SIMULATION RESULTS

MAJOR SYSTEM SEGMENT NO.    201

TIME (MIN)	INFLOW (CMS)	DEPTH (M)	OUTFLOW (CMS)	STORAGE (M3)	* INFLOW (CMS) + DEPTH (M)
.00	.0000	.0000	.0000	.0000	I-----I-----I-----I-----I
10.00	.0000	.0000	.0000	.0000	IS
20.00	.0016	.0017	.0000	.0000	IS
30.00	.0031	.0033	.0000	.0000	I S
40.00	.0038	.0040	.0000	.0000	I S
50.00	.0059	.0062	.0000	.0000	I *+
60.00	.0139	.0146	.0000	.0000	I S
70.00	.0745	.0394	.0000	.0000	I
80.00	.0519	.0350	.0000	.0000	I +
90.00	.0075	.0079	.0000	.0000	I S
100.00	.0124	.0131	.0000	.0000	I S
110.00	.0052	.0054	.0000	.0000	I S
120.00	.0056	.0059	.0000	.0000	I S
130.00	.0038	.0040	.0000	.0000	I S
140.00	.0035	.0037	.0000	.0000	I S
150.00	.0030	.0032	.0000	.0000	I S
160.00	.0027	.0029	.0000	.0000	I S
170.00	.0025	.0026	.0000	.0000	I S
180.00	.0023	.0024	.0000	.0000	I S
190.00	.0021	.0022	.0000	.0000	I S
200.00	.0020	.0021	.0000	.0000	I S
210.00	.0018	.0019	.0000	.0000	I S
220.00	.0017	.0018	.0000	.0000	I S
230.00	.0000	.0000	.0000	.0000	IS
					I-----I-----I-----I-----I

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MAJOR SYSTEM DETAILED SIMULATION RESULTS

MAJOR SYSTEM SEGMENT NO.    202



TIME (MIN)	INFLOW (CMS)	DEPTH (M)	OUTFLOW (CMS)	STORAGE (M3)	* INFLOW (CMS) + DEPTH (M)
.00	.0000	.0000	.0000	.0000	.00E+00
10.00	.0000	.0000	.0000	.0000	.54E-01
20.00	.0038	.0038	.0000	.0000	.11E+00
30.00	.0068	.0069	.0000	.0000	.16E+00
40.00	.0085	.0086	.0000	.0000	.22E+00
50.00	.0135	.0137	.0000	.0000	.27E+00
60.00	.0326	.0309	.0000	.0000	
70.00	.2700	.0671	.0000	.0000	
80.00	.2431	.0650	.0000	.0000	
90.00	.0674	.0375	.0000	.0000	
100.00	.0424	.0328	.0000	.0000	
110.00	.0180	.0182	.0000	.0000	
120.00	.0162	.0164	.0000	.0000	
130.00	.0107	.0109	.0000	.0000	
140.00	.0097	.0098	.0000	.0000	
150.00	.0082	.0083	.0000	.0000	
160.00	.0074	.0075	.0000	.0000	
170.00	.0067	.0068	.0000	.0000	
180.00	.0061	.0062	.0000	.0000	
190.00	.0056	.0057	.0000	.0000	
200.00	.0052	.0053	.0000	.0000	
210.00	.0049	.0050	.0000	.0000	
220.00	.0046	.0047	.0000	.0000	
230.00	.0012	.0012	.0000	.0000	

↑

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Venetian - Town of Uxbridge 17:386  
100 year Storm-Chicago 4 hour storm

MAJOR SYSTEM DETAILED SIMULATION RESULTS

MAJOR SYSTEM SEGMENT NO. 204

TIME (MIN)	INFLOW (CMS)	DEPTH (M)	OUTFLOW (CMS)	STORAGE (M3)	* INFLOW (CMS) + DEPTH (M)
.00	.0000	.0000	.0000	.0000	.00E+00
10.00	.0000	.0000	.0000	.0000	.29E-01
20.00	.0022	.0018	.0000	.0000	.58E-01
30.00	.0038	.0031	.0000	.0000	.86E-01
40.00	.0049	.0040	.0000	.0000	.12E+00
50.00	.0081	.0067	.0000	.0000	.14E+00
60.00	.0202	.0167	.0000	.4284	
70.00	.1439	.0470	.0698	.4750	
80.00	.0881	.0384	.1093	.4750	
90.00	.0152	.0125	.0520	.4750	
100.00	.0186	.0153	.0133	.4750	
110.00	.0083	.0069	.0053	.4750	
120.00	.0092	.0076	.0009	.4750	
130.00	.0061	.0050	.0000	.0000	
140.00	.0060	.0049	.0000	.0000	
150.00	.0049	.0041	.0000	.0000	
160.00	.0045	.0037	.0000	.0000	
170.00	.0041	.0034	.0000	.0000	
180.00	.0037	.0031	.0000	.0000	
190.00	.0035	.0029	.0000	.0000	
200.00	.0032	.0027	.0000	.0000	
210.00	.0030	.0025	.0000	.0000	
220.00	.0028	.0023	.0000	.0000	
230.00	.0008	.0007	.0000	.0000	

↑

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100 year Storm-Chicago 4 hour storm

MAJOR SYSTEM DETAILED SIMULATION RESULTS

MAJOR SYSTEM SEGMENT NO. 207

TIME (MIN)	INFLOW (CMS)	DEPTH (M)	OUTFLOW (CMS)	STORAGE (M3)	* INFLOW (CMS) + DEPTH (M)
.00	.0000	.0000	.0000	.0000	I
10.00	.0000	.0000	.0000	.0000	IS
20.00	.0014	.0012	.0000	.0000	IS
30.00	.0027	.0023	.0000	.0000	I S
40.00	.0036	.0030	.0000	.0000	I S
50.00	.0057	.0048	.0000	.0000	I S
60.00	.0140	.0118	.0000	.0000	I +*
70.00	.0986	.0404	.0354	.4880	I +*
80.00	.0600	.0343	.0616	.4880	I +
90.00	.0128	.0109	.0222	.4880	I +*
100.00	.0129	.0109	.0000	.0000	I +*
110.00	.0073	.0062	.0000	.0000	I S
120.00	.0064	.0055	.0000	.0000	I +*
130.00	.0051	.0043	.0000	.0000	I S
140.00	.0043	.0036	.0000	.0000	I +*
150.00	.0039	.0033	.0000	.0000	I S
160.00	.0034	.0029	.0000	.0000	I S
170.00	.0031	.0026	.0000	.0000	I S
180.00	.0028	.0024	.0000	.0000	I S
190.00	.0026	.0022	.0000	.0000	I S
200.00	.0024	.0021	.0000	.0000	I S
210.00	.0023	.0019	.0000	.0000	I +*
220.00	.0022	.0018	.0000	.0000	I +*
230.00	.0009	.0008	.0000	.0000	IS

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MAJOR SYSTEM  
SUMMARY OF SIMULATION RESULTS

SEGMENT NO	MAX. FLOW (CMS)	MAX. DEPTH (MM)	MAX. CAPTURE (L/S)	INLET RESTRICTION	MAX. STORAGE (M3)	
1	201	.0745	39.	63.8	NO	.0000
2	202	.2700	67.	257.6	NO	.0000
3	203	.1184	56.	29.9	NO	.0000
4	204	.1439	47.	10.0	NO	.4750
5	205	.0749	35.	21.8	NO	.0000
6	206	.0661	39.	19.8	NO	.0000
7	207	.0986	40.	19.0	NO	.4880
8	208	.0807	38.	23.2	NO	.0000
9	209	.0564	34.	17.6	NO	.0000
10	210	.0766	41.	22.2	NO	.0000
11	401	.0315	90.	31.5	NO	.0000
12	402	.0249	95.	24.8	NO	.0000
13	404	.1147	169.	114.5	NO	.0000
14	405	.2063	212.	206.1	NO	.0000
15	406	.0253	81.	25.3	NO	.0000
16	407	.0808	128.	80.8	NO	.0000
17	408	.0146	76.	14.6	NO	.0000
18	409	.1805	201.	180.4	NO	.0000
19	411	.0054	51.	5.4	NO	.0000
20	412	.0087	64.	8.7	NO	.0000
21	413	.0234	93.	23.3	NO	.0000
22	414	.0121	71.	12.1	NO	.0000
23	415	.1660	195.	.0	-	.0000
24	416	.0285	100.	.0	-	.0000
25	417	.0662	137.	.0	-	.0000
26	418	.0657	137.	.0	-	.0000
27	419	.1746	199.	.0	-	.0000
28	420	.0432	117.	43.2	NO	.0000
29	421	.0334	105.	33.4	NO	.0000

\*\*\* SIMULATION ENDED NORMALLY \*\*\*

**Manning's Calculator (Right-of way Flow)**

Job Number: **17:386**

Description:

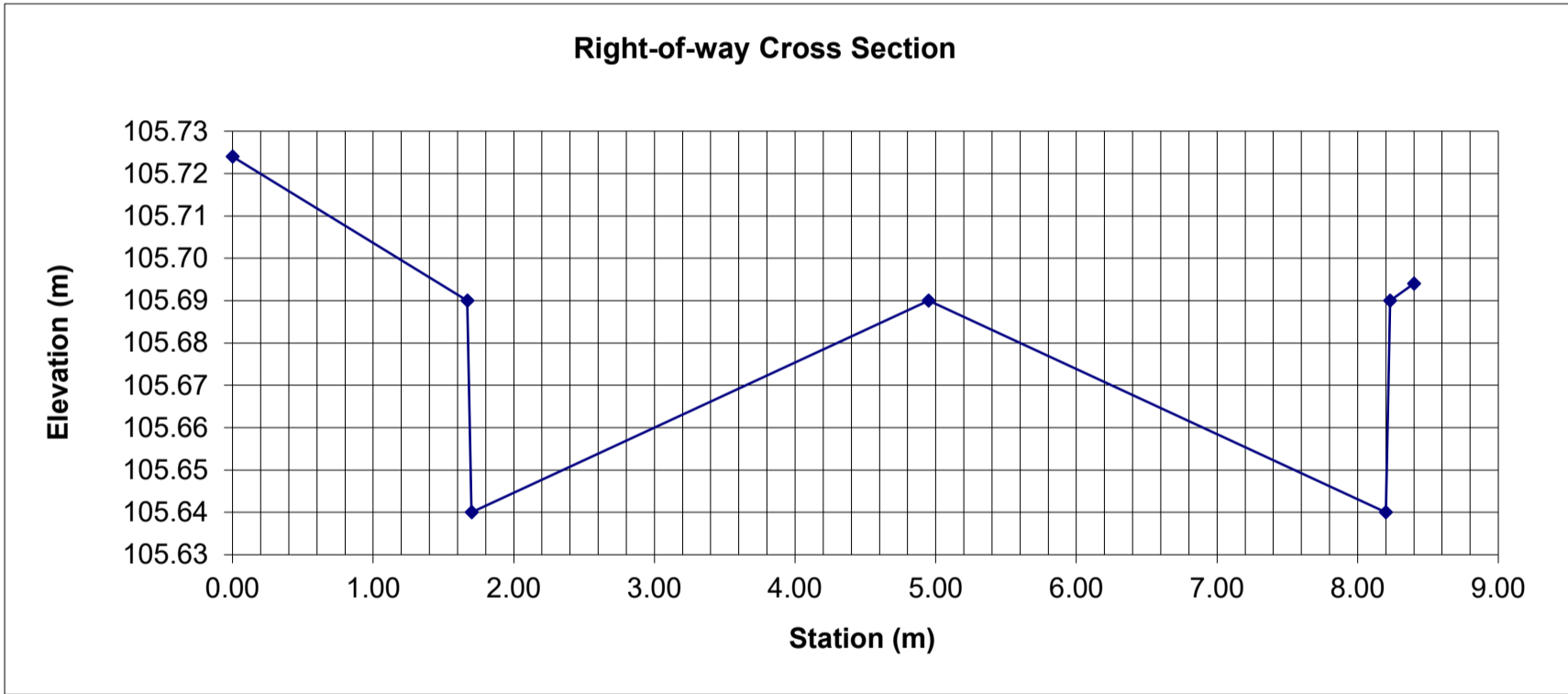
Comparison between the maximum generated OTTSWMM major system flow and ROW capacity of the flattest section of the road in the proposed subdivision

**Right-of-way Geometry**

		Manning's	
Total ROW width =	8.40 m		0.014 (composite)
Pavement Width =	6.50 m		0.013
Sidewalk width =	1.50 m		0.013
Sidewalk BLVD width =	1.70 m		0.035
Other BLVD width =	0.20 m		0.035

Road Grade =	0.50%
Pavement Cross fall =	2.00%
Sidewalk BLVD slope =	2.00%
Other BLVD slope =	2.00%

Point	Station (m)	Elevation (m)
Sidewalk BLVD	0.00	105.72
Top of Curb	1.67	105.69
Bottom of Curb	1.70	105.64
Centerline	4.95	105.69
Bottom of Curb	8.20	105.64
Top of Curb	8.23	105.69
Other BLVD	8.40	105.69



**Flow Capacity**

Right-of-way Flow

Area =	0.414 m <sup>2</sup>
Wetted Perimeter =	8.640 m
Hydraulic Radius =	0.048 m
Velocity =	0.664 m/s
<b>Flow =</b>	<b>0.28 m<sup>3</sup>/s</b>

OTTSWMM major system flow = **0.27 m<sup>3</sup>/s**

**APPENDIX G**  
**Sediment Trap Sizing Calculations**

**Sediment Trap #1  
Storage**

Drainage Area to Sediment Trap = 1.0 ha

Required Sediment Trap Volume = 124 m<sup>3</sup>

=Area x  
125 m<sup>3</sup>/ha

Provided Sediment Trap Top Dimensions

Length = 13.5 m

Width = 6.8 m

Area = 91.1 m<sup>2</sup>

Provided Sediment Trap Bottom Dimensions

Length = 11.8 m

Width = 5.0 m

Area = 58.8 m<sup>2</sup>

Sediment Trap Depth = 1.75 m

Provided Storage Volume = 131 m<sup>3</sup>

Bottom Elevation = 278.15 m

Top Elevation = 279.90 m

Weir Elevation = 280.20 m

### Sediment Trap #2 Storage

Drainage Area to Sediment Trap = 1.7 ha

Required Sediment Trap Volume = 210 m<sup>3</sup>

=Area x  
125 m<sup>3</sup>/ha

Provided Sediment Trap Top Dimensions

Length = 17.0 m

Width = 8.5 m

Area = 144.5 m<sup>2</sup>

Provided Sediment Trap Bottom Dimensions

Length = 15.3 m

Width = 6.8 m

Area = 102.9 m<sup>2</sup>

Sediment Trap Depth = 1.75 m

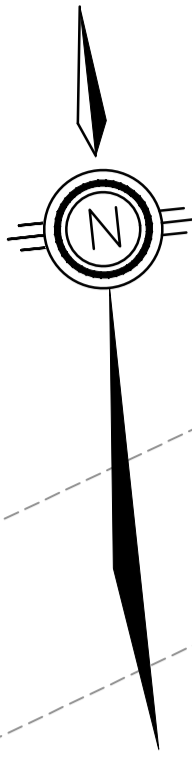
Provided Storage Volume = 217 m<sup>3</sup>

Bottom Elevation = 277.65 m

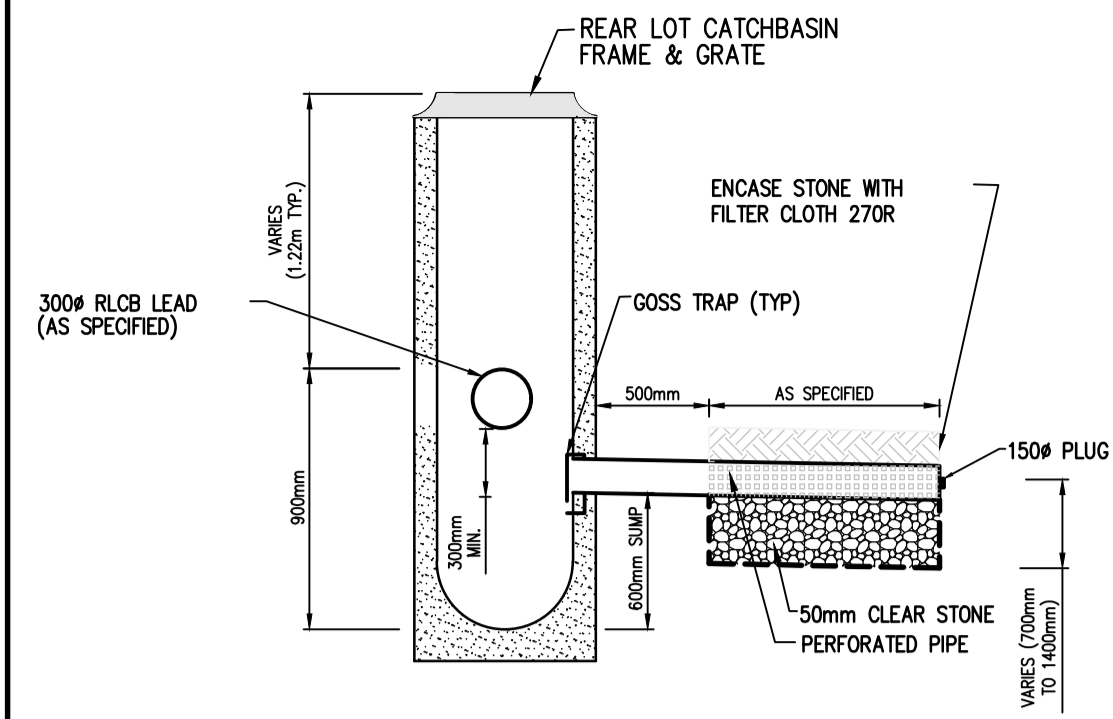
Top Elevation = 279.40 m

Weir Elevation = 279.70 m

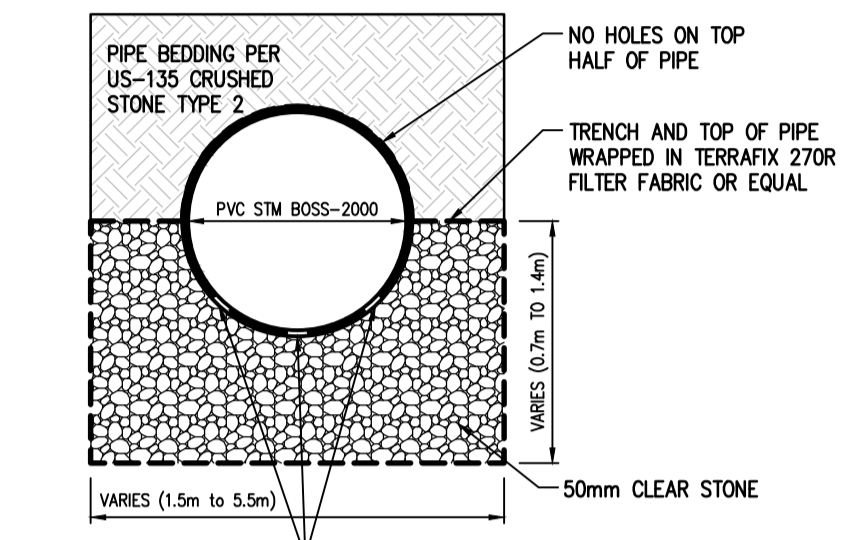




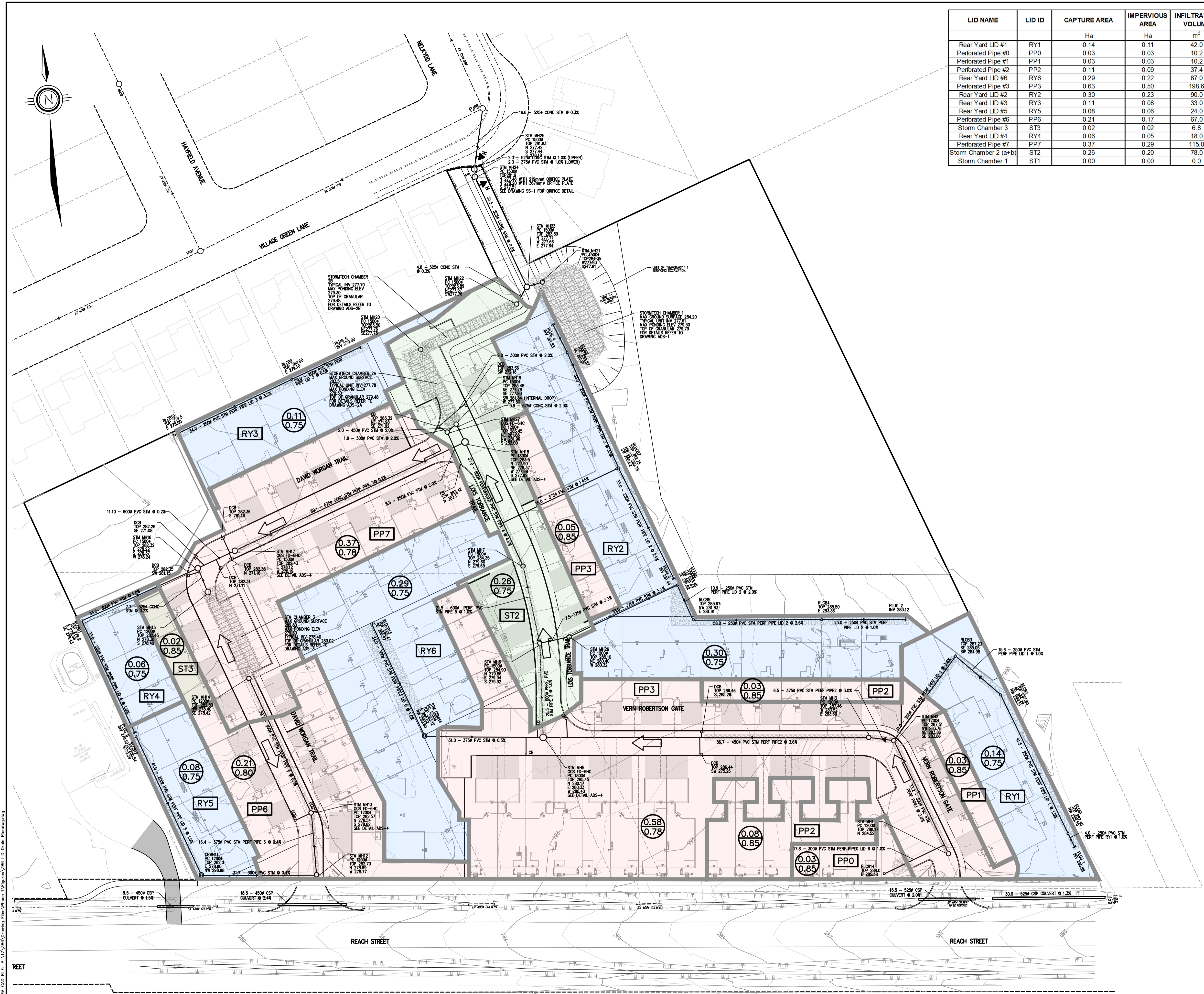
LID NAME	LID ID	CAPTURE AREA	IMPERVIOUS AREA	INFILTRATION VOLUME
Rear Yard LID #1	RY1	Ha	Ha	m <sup>3</sup>
Perforated Pipe #0	PP0	0.14	0.11	42.0
Perforated Pipe #1	PP1	0.03	0.03	10.2
Perforated Pipe #2	PP2	0.11	0.09	37.4
Rear Yard LID #6	RY6	0.29	0.22	87.0
Perforated Pipe #3	PP3	0.63	0.50	198.6
Rear Yard LID #2	RY2	0.30	0.23	90.0
Rear Yard LID #3	RY3	0.11	0.08	33.0
Rear Yard LID #5	RY5	0.08	0.06	24.0
Perforated Pipe #6	PP6	0.21	0.17	67.0
Storm Chamber 3	ST3	0.02	0.02	6.8
Rear Yard LID #4	RY4	0.06	0.05	18.0
Perforated Pipe #7	PP7	0.37	0.29	115.0
Storm Chamber 2 (a+b)	ST2	0.26	0.20	78.0
Storm Chamber 1	ST1	0.00	0.00	0.0



TYPICAL PERVIOUS RLCB (MODIFIED OPSD 705.010)  
N.T.S.



PERFORATED PIPE TYPICAL DETAIL  
N.T.S.



- LEGEND**
- REAR YARD DRAINAGE BOUNDARY
  - PERFORATED PIPE DRAINAGE BOUNDARY
  - STORMTECH CHAMBER DRAINAGE BOUNDARY
  - OVERLAND FLOW ROUTE
  - 0.25 - AREA IN HECTARES
  - 0.25 - RUNOFF COEFFICIENT
  - RY1 - REAR YARD DRAINAGE AREA
  - PP1 - PERFORATED PIPE DRAINAGE AREA
  - ST1 - STORMTECH CHAMBER DRAINAGE AREA
  - DIRECTION OF SEWER FLOW PROPOSED
  - DIRECTION OF SEWER FLOW EXISTING

REACH STREET LANDS  
L.I.D. DRAINAGE PLAN



PROJECT NUMBER: 17:386  
FIGURE NUMBER: 2

SCALE 1:500

PLOT DATE: 10/14/2021 4:23 PM CDD FILE: P:\17386\Drawings\Plan\Phase 1\Reach\_Lands\_Plan.dwg  
 PLOT DATE: 10/14/2021 4:23 PM CDD FILE: P:\17386\Drawings\Plan\Phase 1\Reach\_Lands\_Plan.dwg