FARSIGHT HOMES
FUNCTIONAL SERVICING AND
STORMWATER MANAGEMENT REPORT

This document is intended for preliminary review in support of Draft Plan Approval only and shall not be relied upon for construction or bidding purposes.

Prepared for: FarSight Homes

Prepared by: Sabourin Kimble & Associates Ltd.
110 Old Kingston Road
Ajax, Ontario
L1T 2Z9

File: 13:286

Date: December 2018, Revised November 2022

TABLE OF CONTENTS

1.0 INTRODUCTION....1
2.0 STUDY AREA....2
3.0 DEVELOPMENT CONCEPT....4
4.0 SUPPORTING STUDIES....6
4.1 Hydrogeological Assessment....6
5.0 MUNICIPAL SERVICES....7
5.1 Site Grading....7
5.2 Storm Drainage....8
5.2.1 Existing Conditions....8
5.2.2 External Drainage Areas....8
5.2.3 Proposed Storm Servicing....8
5.3 Sanitary Drainage....10
5.3.1 Existing Conditions....10
5.3.2 Proposed Sanitary Servicing....10
5.3.3 Existing Sanitary Sewage Treatment Plant....11
5.4 Water Supply....11
6.0 STORMWATER MANAGEMENT CRITERIA....12
6.1 LID Guidelines....12
7.0 PROPOSED STORMWATER MANAGEMENT DESIGN....13
7.1 Overall Stormwater Management Strategy....13
7.2 Stormwater Management Facility Details....15
7.2.1 Pre-Development Flows....15
7.2.2 Existing Groundwater Levels....15
7.2.3 Water Quality Control....17
7.2.4 Volume Control and LIDs....18
7.2.5 Water Quantity Control....19
8.0 FLOODPLAIN ANALYSIS....22
8.1 Existing Conditions....22
8.2 Proposed Conditions....22
8.3 Floodplain Storage....24
9.0 EROSION AND SEDIMENTATION CONTROLS....27
10.0 CONCLUSIONS....28

LIST OF APPENDICIES

APPENDIX A - WSP Infiltration Assessment

APPENDIX B - Preliminary Design Sheets and Cross Sections

APPENDIX C - Stormwater Management Design Calculations

APPENDIX D - Hydrologic Model

APPENDIX E - Floodplain Hydraulics

APPENDIX F - OGS Sizing Calculations

LIST OF FIGURES

Figure 1 - Study Area 3
Figure 2 - Development Concept.....5
Figure 3 - Preliminary Grading……..(Back Pocket)
Figure 4 - Existing Storm Drainage…….....9
Figure 5 - Proposed Storm Servicing……(Back Pocket)
Figure 6 - Proposed Sanitary Servicing……(Back Pocket)
Figure 7 - Proposed Sanitary Outlet……...(Back Pocket)
Figure 8 - Proposed Water Distribution……(Back Pocket)
Figure 9 - LID Strategy……(Back Pocket)
Figure 10 - LID Detail…..14
Figure 11 - Pre Development Drainage Area……16
Figure 12 - Post Development Drainage Area……..(Back Pocket)
Figure 13 - Pre Development Floodplain Hydraulics……..(Back Pocket)
Figure 14 - Post Development Floodplain Hydraulics……..(Back Pocket)
Figure 15 - Cut Fill Areas……..25

LIST OF TABLES

Table 1 - Stormwater Management Criteria.....12
Table 2 - Pre Development Peak Flows 15
Table 3 - Existing Groundwater Levels at LIDs.....17
Table 4 - Total Suspended Solids Removal.....17
Table 5 - Phosphorus Removal 18
Table 6 - LID Volumes.....19
Table 7 - Volume Control 19
Table 8 - Elevation/Storage/Discharge Characteristics - Subcatchment 201 20
Table 9 - Elevation/Storage/Discharge Characteristics -Subcatchment 202 20
Table 10 - Elevation/Storage/Discharge Characteristics - Subcatchment 203 20
Table 11 - Elevation/Storage/Discharge Characteristics - Subcatchment 204 21
Table 12 - Peak Flow and Storage Requirements 21
Table 13 – Regional Water Surface Elevations 23
Table 14 – Floodplain Storage 25

1.0 INTRODUCTION

Sabourin Kimble & Associates Ltd. has been retained by FarSight Homes to conduct a Functional Servicing and Stormwater Management assessment for the proposed subdivision in the Village of Ballantrae-Musselman's Lake. This Functional Servicing and Stormwater Management Report has been prepared in support of the Draft Plan of Subdivision for the proposed development.

This report identifies how servicing and stormwater management will be provided and how that will fit into the overall development framework. The proposed development is predicated on the provision of grading revisions to the Regional Storm floodplain. It is proposed to remove an existing trapezoidal man-made channel and associated agricultural floodplain and replace it with a naturalized channel and associated natural heritage features forming the centerpiece of this development. The revised channel and floodplain area has been designed based on a cut and fill approach resulting in a net gain in natural habitat and floodplain storage. This report provides a complete evaluation of the existing and proposed floodplain hydraulics, inclusive of a detailed assessment of the resultant floodplain storage.

This report also includes an examination of site grading; water supply; and storm and sanitary drainage; including preliminary designs for each service internal to the site. A complete stormwater management analysis has been carried out including the identification of site constraints and criteria, and preliminary designs for the overall stormwater management concept.

2.0 STUDY AREA

The proposed FarSight subdivision is located in the Ballantrae-Musselman's Lake community, in the Town of Whitchurch-Stouffville. The subject lands consist of three (3) combined properties which are within Lot 19 and 20 of Concession 8, with municipal addresses of 5426, 5452 and 5584 Lakeshore Rd. The proposed development is approximately 16 hectares in size and located within the East Holland River sub-watershed, which is tributary to Lake Simcoe. As such, the works will be subject to standards of both the Lake Simcoe Region Conservation Authority (LSRCA) and the Town of Whitchurch-Stouffville.

The study area is located southeast of the intersection of Highway 48 and Aurora Road, approximately 600m northwest of Musselman's Lake. As shown in Figure 1, the FarSight Homes Lands are bound by existing cultivated land to the north and east, an existing subdivision on Sommer Rumm Crescent to the west, and Lakeshore Road to the south.

SABOURIN KIMBLE
& ASSOCIATES LTD.
CONSULTING ENGINEERS

STUDY AREA

FIGURE No.

1

3.0 DEVELOPMENT CONCEPT

The development concept contemplates 142 single family residential lots, as shown in Figure 2. The proposed draft plan of subdivision anticipates that the proposed revision to the open space/floodplain area is acceptable. The subject lands will be developed as 142 condominium single detached residential units over 7.2 hectares with an additional 2.3 hectares of private road. The development lands will also include a total of 0.5 hectares of dedicated stormwater management blocks located in three (3) separate locations. The redefined floodplain area will be added to two (2) preserved woodlot areas to provide a combined natural heritage system of 5.9 hectares in size. The private roadway system will be self-contained and will connect to Lakeshore Road in one centralized location.

BLOCK 148
OPEN SPACE CONSERVATION

BLOCK 156
FUTURE DEVELOPMENT

BLOCK 157
TEMPORARY TURNING CIRCLE

BLOCK 158
0.3m RESERVE

STREET A

STREET E

STREET F

WALKWAY

BLOCK 145
SWM

BLOCK 146
OPEN SPACE CONSERVATION

BLOCK 147
OPEN SPACE CONSERVATION

BLOCK 144
SWM

BLOCK 143
SWM

BLOCK 154
PRIVATE ROADS

CROSSING
RISE: 1.20m
SPAN: 14.54m
LENGTH: 14.0m

BLOCK 153
PUMPING STATION

BLOCK 151
OPEN SPACE

STREET D

BLOCK 152
6m EMERGENCY ACCESS

BLOCK 150
OPEN SPACE

BLOCK 155
ROAD WIDENING

BLOCK 149
OPEN SPACE

LAKESHORE ROAD

STREET B

STREET C

LIMIT OF 30m BUFFER

EXISTING WETLAND

LIMIT OF OUTERMOST DRIP LINE

EXISTING WOODLAND

SCALE 1:750

FARSIGHT HOMES DEVELOPMENT CONCEPT

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	2

191(W)-19.001

PLOT DATE: 8/18/2020 4:16 PM CAD FILE: P:\13-286\Drawing Files\Phase 1\Figure\3 3rd FSR submission\286 Fig 02 Development Concept.dwg

4.0 SUPPORTING STUDIES

4.1 Hydrogeological Assessment

In support of the consideration of providing Low Impact Development (LID) works on the subject lands, WSP Canada Inc. completed a hydrogeological investigation, which identified in-situ infiltration rates and groundwater levels near proposed stormwater management locations and other areas around the site.

In-situ infiltration testing was completed at four (4) test pits in the subject lands, two in the western proposed stormwater management block and two in the east. Testing was conducted using the Nova Scotia Pask Permeameter twice at each location, at 1m and 2m below ground surface.

Soils in the east SWM block are composed of sandy soils with only trace silts. The conservatively recommended design infiltration rate for these two locations is 40mm/hr, which includes an applied safety factor of 2.5. Boreholes BH16-3 and BH16-4 located north of the SWM block reported similar soil composition, therefore the 40mm/hr infiltration rate has been applied to the entire east half of the site for preliminary design purposes.

In the west SWM block, the test pit identified silt and clay, with only trace sand. The recommended infiltration rate with factor of safety for these two test pits is 16mm/hr. Boreholes BH16-1 and BH16-5 located east of the SWM block, show a similar soil profile, therefore a design infiltration rate of 16mm/hr has been selected for the entire west half of the site.

A bi-monthly monitoring program was implemented in June 2016 to record groundwater levels across the subject site every two (2) months for a period of one year. The purpose of the bi-monthly monitoring program was to characterize seasonal variations in groundwater level and to determine the seasonal high groundwater level. Groundwater levels were obtained at twelve (12) locations throughout the site. Seasonally high groundwater elevation contours have been generated and shown on Figure 10 in the WSP report. A copy of the WSP hydrogeological investigation is included in Appendix A.

5.0 MUNICIPAL SERVICES

5.1 Site Grading

The existing grades generally fall from northwest to southeast towards Lakeshore Road. High points in the east and west side direct flow inwards to the central drainage feature. The existing ground has mild slope of approximately 0.5 to 2.0 percent, and there is approximately 6m of total fall across the site.

The development concept and associated limits were developed based on a revised centralized channel design. The channel and associated floodplain relocation will be realized through a cut and fill approach to provide a more appropriate natural heritage feature through the center of the development site. A balanced cut/fill plan was developed for the revised channel resulting in the following site grading considerations:

i. Sufficient cover must be provided such that, a storm sewer could discharge into the channel above the 100yr flood elevation,
ii. Proposed grading should be provided to ensure that storm sewers with conventional cover would be located above the seasonally high groundwater levels,
iii. Rear lot corners should be established a minimum 2m above the observed high groundwater level to allow potential for rear lot LIDs,
iv. Basement underside of footings should be located high enough to reduce susceptibility to interference with the water table.

In an effort to effectively address these constraints, the proposed grading plan involves raising the internal areas of the site by approximately 1 to 2m. As shown in Figure 3 (back pocket), lots will be protected from the Regional storm flood elevation of the proposed channel with 0.3 to 0.5m of freeboard. Internal lot grading includes a mix of front draining and split draining lots. The bulk of the lots around the site perimeter and adjacent to natural channel will be graded as walkouts or deck lots. This approach maximizes the ability to raise the site and still match into existing perimeter grades. The grading approach for the lots and roads has been designed to satisfy current Town of Whitchurch-Stouffville grading criteria.

5.2 Storm Drainage

5.2.1 Existing Conditions

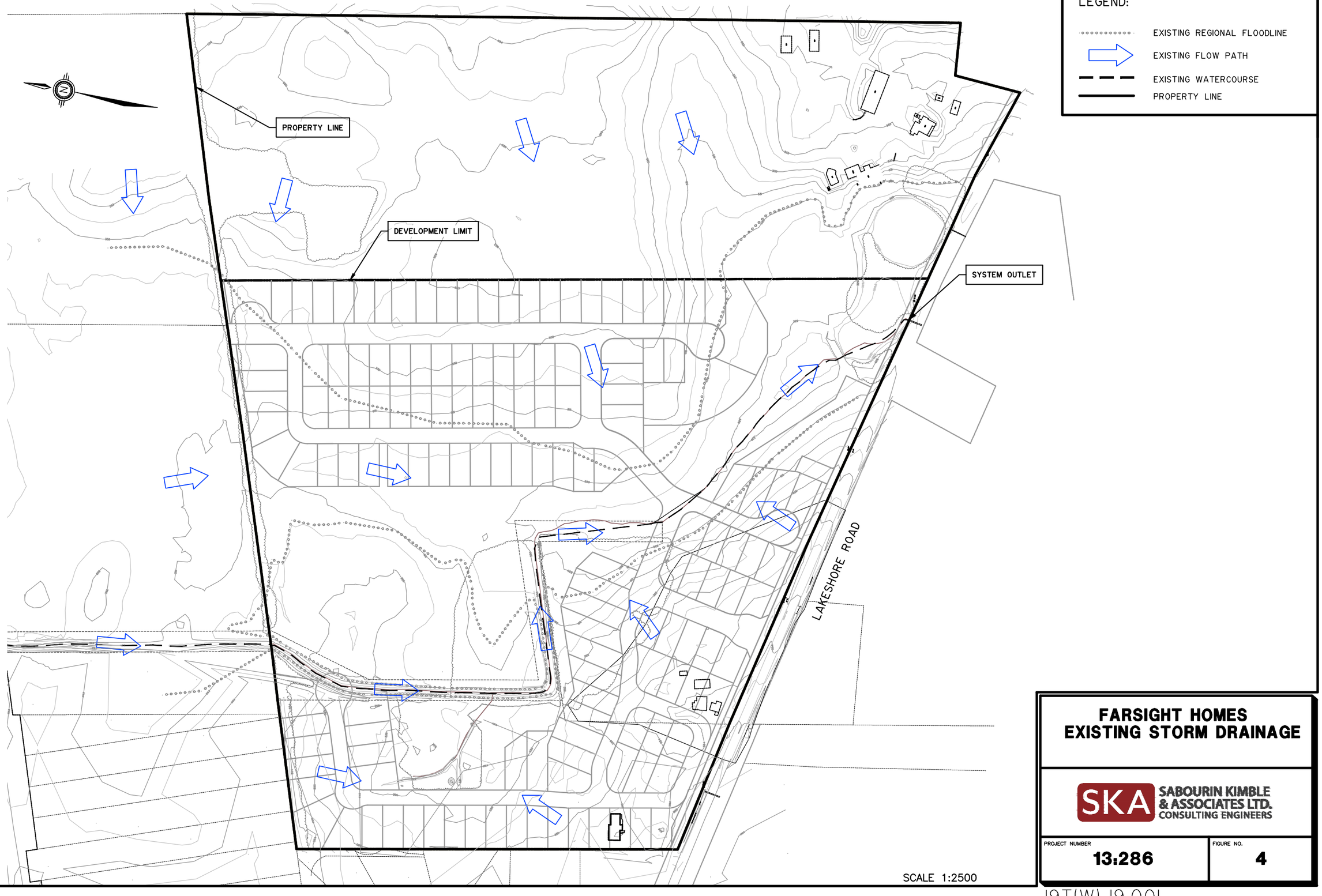
As shown in Figure 4, there are no existing storm sewers within the site. The site drains overland to a watercourse which flows through the subject site and outlets to a culvert under Lakeshore Road. The watercourse bisecting the site is a tributary of the East Holland River and consists of three (3) distinct sections. Originating at Aurora Sideroad, a man-made channel flows south through an easement in favour of the Town to a location approximately halfway through the site. The altered channel outlets to an ill-defined channel area which continues south and outlets to a small wetland/pond prior to discharging under Lakeshore Road.

5.2.2 External Drainage Areas

The site accepts external drainage from lands to the north, east and west of the site. A small drainage area from the rear yards of existing residential units to the northwest will discharge overland flow into the proposed storm sewer system for the subdivision. Existing agricultural fields and a portion of a small woodlot contribute overland flow to the east limit of the site. A portion of these lands will be accepted into the storm drainage system for the site with the remaining area directed around the site and into the centralized floodplain area. The external areas have been considered in the storm drainage system design outlined in the following section plus the stormwater management system design outlined in section 7.0 of this report. Appendix C contains supporting calculations to demonstrate that the emergency flow from the external areas can be safely conveyed through the subject site.

5.2.3 Proposed Storm Servicing

As shown in Figure 5 (back pocket), the site will be serviced with storm sewers which outlet to the receiving watercourse in four (4) distinct locations. In the east and south portions of the site, the storm sewer system has been designed to outlet to a centralized stormwater management facility which provides infiltration, water quality and water quantity controls. The grading and ground water constraints in the west portion of the site do not support a centralized infiltration/stormwater management facility. Therefore, stormwater management controls are provided through the use of oversized storm sewers in combination with an oil/grit separator and sand filter. Emergency overflow in this area will be provided through Headwall 5 for storm events larger than the 5-year.



CAD FILE: P:\13\286\Drawing Files\Phase 1\Figures\3- 3rd FSSR Submission\286 Fig 04, 11-12 Post Development V2.dwg

FARSIGHT HOMES
EXISTING STORM DRAINAGE

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	4

19T(W)-19.001

Within this servicing area, the oversized pipes and the associated lot grading results in a number of lots which are difficult to service with a conventional gravity storm house connection. Based on the preliminary design, there are twenty-four (24) units where a gravity house connection is considered not feasible and as a result, a foundation drain sump pump will be required. These units are shown with an asterisk in Figure 5. The need for sump pumps on all lots within the plan will be further reviewed as part of the detailed design process.

The storm sewer system has been sized according to the Town of Whitchurch-Stouffville design criteria. Major system capture design and calculations will be provided at detailed design. Preliminary storm sewer design sheets and a storm drainage plan are included in Appendix B.

5.3 Sanitary Drainage

5.3.1 Existing Conditions

There are no existing sanitary sewers within the subject lands or on Lakeshore Road to the south. The sanitary drainage from the site will ultimately flow to the existing sewage treatment plant located within the Ballantrae Golf and Country Club community as outlined in the following sections.

5.3.2 Proposed Sanitary Servicing

As shown in Figure 6 (back pocket), the entire site will be serviced with a sanitary sewer system that drains to a centralized private pumping station. As shown in Figure 7 (back pocket), from the pumping station, sanitary flows will be conveyed to the sanitary treatment facility via forcemain located within the existing easement, east along Aurora Sideroad and into the sewage treatment plant via an access road. Capacity at the sewage treatment plant is outlined in the following section 5.3.3.

The proposed sanitary sewers have been designed according to Town of Whitchurch-Stouffville design criteria and are sufficiently deep to service each residential unit by gravity. The sanitary sewer crossing of the revised watercourse has been designed with sufficient depth to allow 1.5 metres of cover between the proposed channel invert and the obvert of the sanitary sewer. The design of the private pumping station and wet-well will be completed as part of the detailed design of the subdivision.

A sanitary design sheet and sanitary drainage plan are included in Appendix B.

5.3.3 Existing Sanitary Sewage Treatment Plant

The Ballantrae Wastewater Treatment Plant (WWTP) services the Ballantrae Golf and Country Club and associated community. Currently, the WWTP services approximately 894 units, a Public School, a Community Centre, the golf course and club house.
The Ballantrae WWTP consists of Sequencing Batch Reactor (SBR) technology, followed by tertiary filtration, and ultraviolet light disinfection. The WWTP has a Certificate of Approval (C of A) rated average day flow (ADF) capacity of 1,045 m^3/d. The WWTP is currently operating at approximately 42 percent of the rated capacity.

In October 2014, Hatch Mott MacDonald completed a review of the existing WWTP capacity anticipating the addition of approximately 200 dwelling units. The report provides a complete review of the historic and projected flows to the plant plus an assessment of the additional capacity available. The report concluded that the plant has capacity to treat the additional 200 units which would increase the operation of the WWTP to approximately 80 percent of the plant's rated capacity. A copy of the WWTP assessment report is included in Appendix B.

Since this 2014 assessment, 94 of the 200 units have been approved for a proposed development plan within the Ballantrae Village limits. It is proposed to discharge and treat the sewage from the 142 units in this plan within the WWTP anticipating that the additional 34 units (in excess of the allotted 200 units) will be serviced in the remaining 20% of the plant's rated capacity. A review of this approach is underway and will be forwarded upon completion.

5.4 Water Supply

As shown in Figure 8 (back pocket), there is an existing 300 mm diameter watermain located on Lakeshore Road and an existing 250 mm diameter watermain located on Aurora Road. A connection will be made to the existing watermains within Lakeshore Road and Aurora Road to service the site. The connection to Aurora Road will be made through the existing drainage easement. Internal watermains will be designed to provide adequate domestic and fire flows for the proposed development.

6.0 STORMWATER MANAGEMENT CRITERIA

Stormwater management criteria for the subject site were established according to the LSRCA's *Technical Guidelines for Stormwater Management Submissions (2016),* the LSRCA's *Phosphorus Offsetting Policy (*effective January 1st, 2018*),* the Ontario Ministry of the Environment's MOE *Stormwater Management Planning and Design Manual (2003),* and pre-consultation with the Town of Whitchurch-Stouffville.

Table 1 - Stormwater Management Criteria

Control	Criteria
Water Quality	Enhanced fisheries protection as outlined in the MOE Stormwater Management Practices Planning and Design Manual. Zero net increase in phosphorous loading from pre-development conditions with compensation for exceedances according to the Phosphorus Offsetting Policy.
Erosion Control	Detention of the 25mm 4-hour Chicago storm runoff for a minimum of 24 hours.
Water Quantity	Control post development flows to pre-development levels for the 2 through 100 year storms.
Volume Control	Post-construction runoff volume from the total impervious area produced by a 25 mm rainfall event shall be retained and treated on site.
Water Balance	Maintain the pre-development water balance under post development conditions.
Regulatory Storm Conveyance	Demonstrate safe conveyance of the Regulatory Storm through the development site to a sufficient outlet

6.1 LID Guidelines

In April 2015, the LSRCA published the Lake Simcoe Watershed LID SWM Guidelines for Municipalities. The main objective of the guidelines are to identify minimal impact design standard approaches for Low Impact Development stormwater management techniques. Much of the document is focused on better site design techniques to control and reduce runoff volume from any given development site. A number of stormwater volume reduction performance goals are identified in the document with the following goal outlined for new development:

For new, nonlinear developments that create more than 0.5 hectares of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and 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.

7.0 PROPOSED STORMWATER MANAGEMENT DESIGN

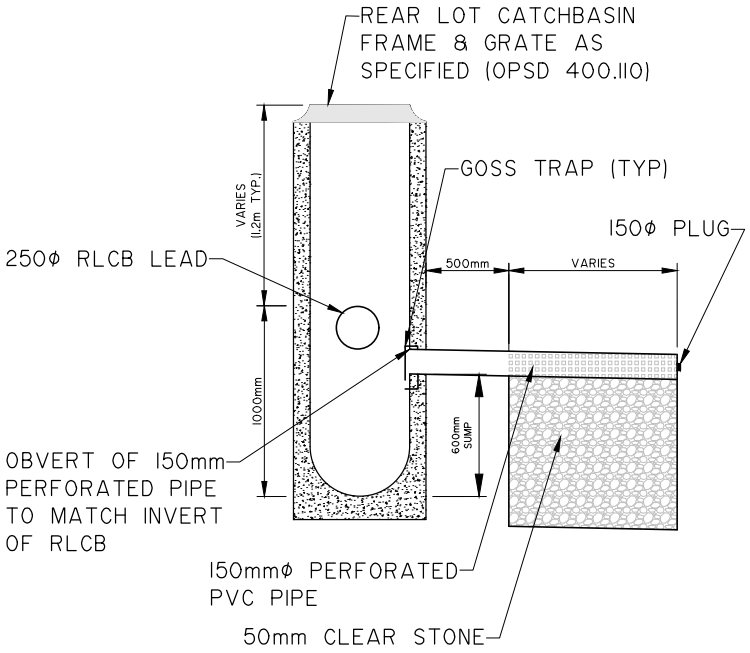
7.1 Overall Stormwater Management Strategy

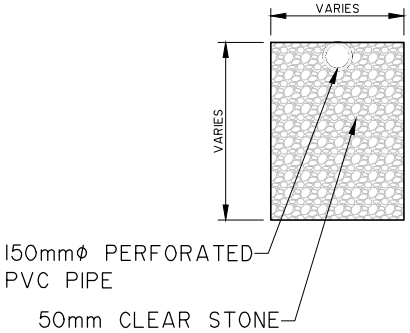
The stormwater management approach has been developed to reflect the LID Guidelines and the infiltration capacity of the site and provide infiltration capacity for the 25mm storm runoff volume from impervious surfaces. It is proposed that these works will adequately address the overall stormwater management criteria for water quality control and erosion control as outlined in Table 1. Additional water quantity storage will be provided in order to adequately meet pre-development peak flow targets.

Six (6) distinct infiltration systems will be provided throughout the site as shown in Figure 9 (back pocket). Rear yard granular galleries have been provided in three locations and have been identified as LID's 1, 5, and 6. These galleries will accept rear yard drainage from rear lot catchbasins outfitted with perforated leads as shown in Figure 10. In the event that any of the galleries become full, an overflow will be provided which outlets to a street storm sewer or directly to a centralized stormwater management facility. Three (3) centralized infiltration galleries (identified as LIDs 3, 4 and 7) have also been proposed and are incorporated into an open bottom storage system (Stormtech) which also provides water quantity control.

Water quantity control has been provided by four (4) distinct systems as shown in Figure 11 (back pocket). Open bottom Stormtech storage systems have been combined with infiltration LIDs 3, 4 and 7 to provide the additional storage required to meet water quantity targets. In the western area of the plan (identified as area 201), existing groundwater elevations are too high to incorporate infiltration works. However, water quantity storage will be provided in a 900x1800 mm box storage pipe. Each of the four water quantity storage facilities is equipped with an oil grit separator to provide quality control and stacked orifice plate controls. Additional quality control for catchment 201 is provided by a plunge pool/sand filter combination.

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

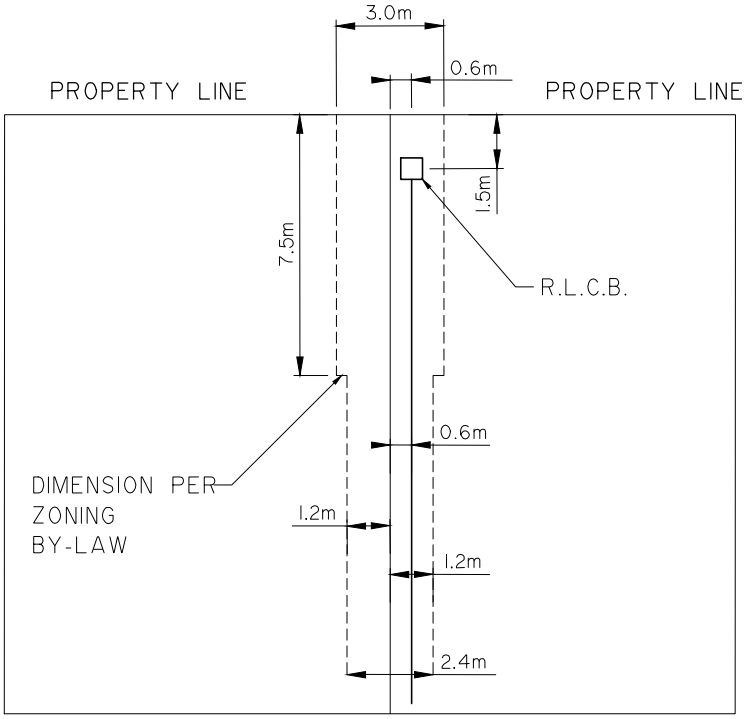




TYPICAL PERVIOUS RLCB AND LID

(MODIFIED OPSD 705.010)

NTS



TYPICAL PLAN VIEW FOR RLCB AND LID

TYPICAL RLCB

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	10

7.2 Stormwater Management Facility Details

7.2.1 Pre-Development Flows

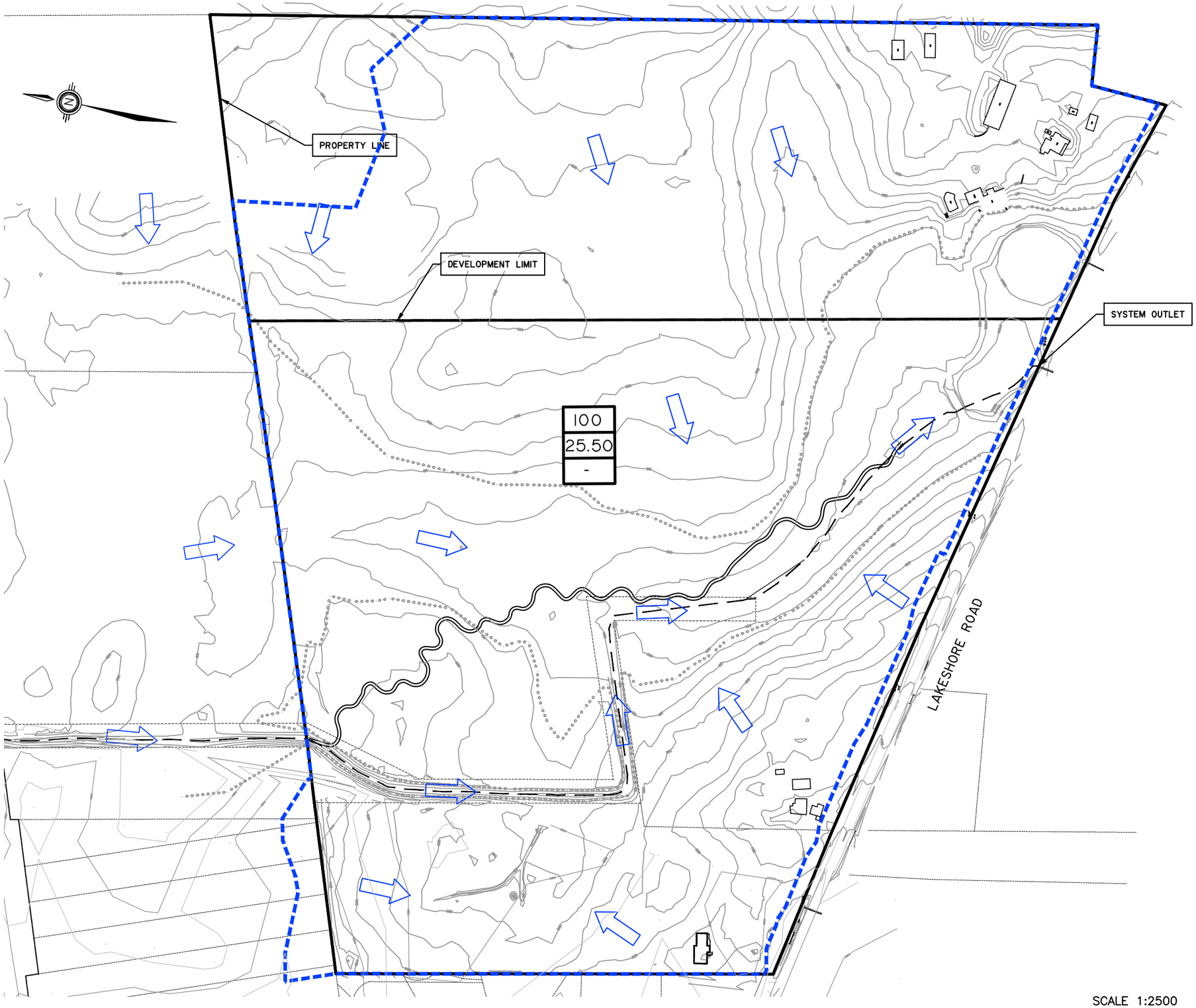
A pre-development VO3 hydrology model was developed to establish the target discharges for the site. As shown in Figure 12 the subject site and external areas tributary to the site's proposed stormwater management system were modelled to establish the target flows. The lands north of the site were not considered in the evaluation of target discharges as they are not tributary to the stormwater management system for the subject site. In keeping with LSRCA criteria return period flows were generated for 12 hour SCS and a 4 hour Chicago storms. The resultant peak flows are summarized in Table 2.

Table 2 - Pre-Development Peak Flows

Storm	12 Hour SCS (m^3/s)	4 Hour Chicago (m^3/s)
2 Year	0.20	0.14
5 Year	0.35	0.25
10 Year	0.48	0.34
25 Year	0.63	0.45
50 Year	0.75	0.58
100 Year	0.87	0.72

7.2.2 Existing Groundwater Levels

As outlined in Section 5 of this report, the site grading and servicing has been raised as much as possible to minimize interference with high groundwater levels. The proposed grading and servicing scheme allows for adequate separation of the proposed infiltration facilities from high groundwater levels within the interior of the site. LID facilities have been considered in areas of the development that proposed grading allows for the minimum 1.0 metre (minimum) separation from the high groundwater elevation. This has been achieved in all centralized Stormtech facilities, and most rear yard infiltration galleries as outlined in Table 3. Figure 9 (back pocket) shows the proposed LIDs in conjunction with the seasonally high groundwater elevations established by WSP.



SCALE 1:2500

FARSIGHT HOMES
EXISTING DRAINAGE AREAS

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	11

CAD FILE: P:\13\286\Drawing Files\Phase 1\Figures\3- 3rd FSSR Submission\286 Fig 04, 11-12 Post Development V2.dwg

Table 3 - Existing Groundwater Levels at LIDs

LID Number	Bottom Elevation (m)	High Groundwater Elevation (m)	Separation (m)
1	330.35	328.65	1.85
3	330.24	329.21	1.03
4	329.82	328.79	1.03
5	329.85	329.00	0.85
6	330.26	329.25	1.01
7	329.71	328.68	1.03

7.2.3 Water Quality Control

Each subcatchment will have quality treatment via treatment train techniques to achieve the required 80% total suspended solids (TSS) removal. Oil and grit separators (OGS) will be used in series with both infiltration galleries and a sand filter. The quality control works for each subcatchment and their corresponding treatment train TSS removal efficiencies are summarized in Table 4. Calculations in support of the quality control volumes are included in Appendix C. It should be noted that per the Town's request, a maintenance access road has been provided to the sand filter, though this will remain in private ownership and the condominium corporation will be responsible for maintenance.

Table 4 - Total Suspended Solids Removal

Subcatchment ID	OGS	Infiltration	Sand Filter	Total Removal Efficiency
201	60%	-	60%	84%
202	60%	70%	-	88%
203	60%	70%	-	88%
204	60%	70%	-	88%

In order to ensure zero net increase in phosphorous loading from pre-development conditions per the Lake Simcoe guidelines, the Ministry of the Environment Lake Simcoe Phosphorus Budget Tool was utilized to calculate phosphorous loads under existing, post-development unmitigated and post-development mitigated conditions. For this development, the mitigation measures include the aforementioned sand filters and infiltration facilities, in addition to the naturalization of the floodplain. Consideration of these facilities resulted in a net phosphorous decrease of 0.17kg per year as outlined in Table 5. Phosphorus calculations have been included in Appendix C.

Table 5 - Phosphorus Removal

Development Condition	Phosphorus Load (kg/yr)
Pre-Development	2.90
Post Development – No Mitigation	10.51
Post Development Mitigated	2.73
Net Difference	-0.17

7.2.4 Volume Control and LIDs

The LSRCA LID guidelines stipulate that the primary volume control target is infiltration of the equivalent of 25mm of runoff from impervious surfaces over the entire site. However, at the direction of the LSRCA, the target has been reduced for the subject site to instead target an infiltration balance from existing to proposed conditions across the subject site. This direction was given from the LSRCA due to the 25mm target resulting in post-development infiltration volumes greatly exceeding existing conditions' infiltration volumes.

LID works are located in subcatchments 202, 203 and 204 as shown on Figure 11. The LID volumes are summarized in Table 6. Volume control volumes across the site are summarized in Table 7.

The hydrogeological investigation prepared by WSP includes a detailed water budget analysis which concludes that a 23% increase in infiltration from existing conditions will be provided by the proposed LID plan. It should be noted that these calculations are predicated on the assumption that 80% of annual runoff that is directed each of these facilities will be infiltrated. This assumption is conservative, as the infiltration galleries are sized for a weighted average runoff depth of 21mm, which is representative of approximately 91% of annual rainfall events per the Toronto Wet Weather Flow Management Guidelines. An excerpt has been provided in Appendix C.

Table 6 - LID Volumes

LID #	Impervious Area (ha)	Storage Volume Provided (m^3)	Equivalent Runoff Depth (mm)	
1	0.34	71	21	
3	0.61	214	35	
4	1.86	256	14	
5	0.15	39	26	
6	0.09	10	12	
7	1.13	295	26	
Total	**4.22**	**885**	**Weighted Average**	**21**

Table 7 - Volume Control

Subcatchment	Drainage Area (ha)	Impervious Area (ha)	Percent Impervious	Volume Control Provided (m^3)
201	1.81	1.07	59%	0
202	2.18	1.22	60%	305
203	0.75	0.61	81%	214
204	2.92	1.74	57%	366
Overall	-	4.83	-	**885**

The calculations in support of the volume control are included in Appendix C.

7.2.5 Water Quantity Control

The route reservoir modelling ability of the VO3 hydrology model was used to determine the water quantity storage volumes for each facility.

In order to match or reduce the pre-development subcatchment peak flows under post-development conditions, storage facilities were designed and equipped with stacked orifice plate control structures. Based on these design characteristics, the elevation/storage/discharge characteristics were developed utilizing the V03 hydrologic model. The resulting characteristics are summarized in Tables 8 through 11. Refer to Figure 11 for facility locations.

Table 8 - Elevation/Storage/Discharge Characteristics -Storage Pipe - Subcatchment 201

Storm	Ponding Elevation (m)	Storage Provided (m^3)	Peak Discharge (m^3/sec)
2-year	331.78	257	0.01
5-year	332.10	318	0.05
10-year	332.21	335	0.10
25-year	332.31	352	0.18
50-year	332.60	371	0.34
100-year	332.80	380	0.47

Table 9 - Elevation/Storage/Discharge Characteristics - Stormtech -Subcatchment 202

Storm	Ponding Elevation (m)	Storage Provided (m^3)	Peak Discharge (m^3/sec)
2-year	330.55	234	0.03
5-year	330.73	321	0.04
10-year	330.86	384	0.05
25-year	331.01	448	0.06
50-year	331.22	532	0.07
100-year	331.44	609	0.08

Table 10 - Elevation/Storage/Discharge Characteristics - Stormtech - Subcatchment 203

Storm	Ponding Elevation (m)	Storage Provided (m^3)	Peak Discharge (m^3/sec)
2-year	331.71	96	0.04
5-year	331.89	128	0.06
10-year	332.01	150	0.08
25-year	332.18	174	0.09
50-year	332.36	202	0.10
100-year	332.57	226	0.11

Table 11 - Elevation/Storage/Discharge Characteristics - Stormtech - Subcatchment 204

Storm	Ponding Elevation (m)	Storage Provided (m^3)	Peak Discharge (m^3/sec)
2-year	330.56	638	0.01
5-year	330.71	884	0.01
10-year	330.84	1071	0.02
25-year	330.91	1276	0.02
50-year	331.15	1494	0.02
100-year	331.33	1709	0.02

Calculations in support of the hydrologic model stage-storage curve inputs are included in Appendix C.

The quantity control works are successful in maintaining or reducing the peak flows at the site outlet at Lakeshore Road. The resulting target peak discharges and required storage volumes are summarized in Table 12.

Table 12 - Peak Flow and Storage Requirements

Storm	Peak Flow @ Outlet (m^3/sec)				Required Storage Volume(m^3)			
	Pre-development		Post-development		Storage Pipe 201	Stm tech 202	Stm tech 203	Stm tech 204
	SCS	Chicago	SCS	Chicago				
2-year	0.19	0.13	0.18	0.13	257	234	96	638
5-year	0.33	0.24	0.30	0.23	318	321	128	884
10-year	0.46	0.33	0.43	0.31	335	384	150	1071
25-year	0.60	0.43	0.58	0.38	352	448	174	1276
50-year	0.71	0.56	0.67	0.52	371	532	202	1494
100-year	0.83	0.68	0.75	0.68	380	609	226	1709

The hydrology model input, output and supporting calculations are included in Appendix D.

8.0 FLOODPLAIN ANALYSIS

The proposed development is predicated on the provision of a revision to the Regional Storm floodplain area. It is proposed to remove an existing trapezoidal man-made channel and associated agricultural floodplain and replace it with a naturalized channel and associated natural heritage features forming the centerpiece of this development. The revised channel and floodplain area has been designed based on a cut and fill approach resulting in a net gain in natural habitat and floodplain storage.

8.1 Existing Conditions

The hydraulics model for the site was obtained from the LSRCA in March 2013. This model has since been updated with ground surface topography and additional cross sections to achieve a more representative model output. The pre-development floodplain is shown on Figure 13 (back pocket).

8.2 Proposed Conditions

The proposed floodplain includes the revised channel area and a naturalized floodplain which slopes up at 0.5% to meet the 3:1 slopes supporting the rear yards at the edge of the development. The post-development floodplain is shown on Figure 14 (back pocket). The resulting water surface elevations are compared to existing elevations in Table 13.

Table 13 – Regional Water Surface Elevations

HEC-RAS Cross Section	Pre-development (m)	Post-development (m)
3110	332.82	332.82
3109	332.25	332.25
3108.75	331.71	331.80
3108.6	331.68	331.79
3108.5	331.61	331.77
3108.3	331.44	331.69
3108.25	331.18	331.37
3108	331.02	331.20
3107.75	330.88	331.19
3107.5	330.85	331.18
3107.45	330.53	331.15
3107.4	330.39	331.09
3107.3	330.27	331.07
3107.2	330.21	330.84
3107	330.08	330.44
3106.75	329.90	330.36
3106.5	329.81	330.02
3106.4	329.81	329.81
3106	329.82	329.82

As shown in Table 13, the resultant water surface elevations minimally impact the property to the north as a result of the channel modification. During detailed design, the proposed floodplain design through the property will be refined to minimize any upstream impacts.

8.3 Floodplain Storage

In support of the proposed grading below the regional floodline, a cut/fill analysis was completed to ensure floodplain storage is maintained under post development conditions. Some reductions in storage were observed at 0.25 meter increments, however the on-site works result in an overall net increase in floodplain storage. The results are summarized in Table 4 and cut and fill areas are shown on Figure 15.

Table 14 – Floodplain Storage

Elevation	Storage (m^3)		
	Pre-Development	**Post-Development**	**Net Gain or Loss**
331.75	0	0	0
331.5	149	1072	922
331.25	933	1464	531
331.00	1401	4768	3368
330.75	2660	5291	2631
330.50	2820	3908	1088
330.25	2660	2844	184
330.00	2252	2006	-247
329.75	4073	2324	-1749
329.50	4673	3267	-1406
329.25	3106	1938	-1168
329.00	1876	1436	-440
328.75	989	1063	74
328.50	392	746	354
328.25	59	59	0
Total	28,043	32,186	+4,143

While floodplain storage is not maintained at each elevation interval, a net gain in total floodplain storage is realized. The supporting calculations are included in Appendix E.

LEGEND:

- PROPOSED REGIONAL FLOODLINE
- HEC-RAS STATION / REGIONAL WATER SURFACE ELEVATION (3107.2 / 330.11)
- CROSS-SECTION LOCATION
- FILL UNDER REGIONAL FLOODLINE
- CUT UNDER REGIONAL FLOODLINE
- EXISTING REGIONAL FLOODLINE

SCALE 1:2000

FARSIGHT HOMES PROPOSED CUT AND FILL AREAS

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	15

CAD FILE: P:\13\286\Drawing Files\Phase I\Figures\3- 3rd FSSR Submission\286 Fig 13-15 Floodplain Storage (3rdSubmission).dwg

9.0 EROSION AND SEDIMENTATION CONTROLS

During construction of any portion of the subject lands adequate erosion and sedimentation controls must be implemented to safeguard them against potential impacts. The removal of vegetation, grading and soil compaction should be minimized and limited to only those areas that require alteration to existing grades. In support of the detailed design for any development proposal, a comprehensive construction erosion and sedimentation control plan should be prepared. This plan should detail the works proposed to control erosion on-site and sediment transport from the site to match or exceed current Municipal and Provincial standards. Works such as sediment control fencing, controlled stripping/earthworks practices, undisturbed buffers, filter strips, catchbasin silt sacks and catchbasin/storm sewer sediment traps should be implemented. Specific sedimentation control measures must be designed to safeguard the infiltration facilities from plugging with construction sediment. In support of the erosion and sedimentation control, a construction implementation plan and maintenance protocol should also be established.

Sedimentation 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. Sedimentation 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.

Further details regarding construction timing, potential phasing, and methodology of crossing installation will be provided at detailed design.

10.0 CONCLUSIONS

Based on the findings of this Functional Servicing Study and Stormwater Management Analysis, the following conclusions are reached:

- The subject lands will be developed as residential land use.
- The site will be graded for residential use with a “cut and fill” approach satisfying current Town of Whitchurch-Stouffville criteria.
- The site will be serviced by a storm sewer system having four (4) separate outfalls which discharge into the main watercourse discharging ultimately to the Holland East tributary.
- A minimum 80% TSS removal quality control of the stormwater will be provided by a treatment train approach involving oil/grit separators, infiltration galleries and a sand filter.
- Post-to-pre-development quantity control of the stormwater will be provided by three (3) distinct StormTech underground storage facilities, and one (1) storage pipe system.
- The proposed LID plan allows for post-development infiltration volumes to exceed existing conditions infiltration volumes by 23%
- The proposed floodplain cut and fill results in a net increase in floodplain storage
- The interior of the site will be filled above the existing grade to give storm sewers and LID works clearance from the seasonally high water table.
- The site will be serviced with a sanitary sewer system that drains to a centralized private pumping station. Sanitary flows will be conveyed to the sanitary treatment facility via forcemain located within the existing easement, east along Aurora Sideroad and into the Ballantrae Wastewater Treatment Plant via an access road.
- Water will be provided from two connections, one at the south boundary of the site to the existing 300mm watermain along Lakeshore Road and one to the north to the existing 250mm watermain along Aurora Road. Internal watermains will be designed to provide adequate domestic and fire flows for the proposed development.
- During each phase of construction, adequate erosion and sedimentation controls must be provided in accordance with LSRCA’s Sediment and Erosion Control guidelines.

APPENDIX A

WSP INFILTRATION ASSESSMENT

FAR SIGHT HOMES

HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY

5426, 5452 AND 5584 LAKESHORE ROAD, BALLANTRAE, ONTARIO

APRIL 28, 2021

HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY

5426, 5452 AND 5584 LAKESHORE ROAD, BALLANTRAE, ONTARIO

FAR SIGHT HOMES

PROJECT NO.: 161-06960-00
DATE: APRIL 28, 2021

WSP
UNIT 2
126 DON HILLOCK DRIVE
AURORA, ON, CANADA L4G 0G9

T: +1 905 750-3080
F: +1 905 727-0463
WSP.COM

WSP Canada Inc.

April 28, 2021

FAR SIGHT HOMES
12 Greenvalley Circle, RR3
Newmarket, Ontario
L3Y 4W1

Attention: Mr. Randy Alcorn

Dear Sir:

Subject: Updated Hydrogeological Assessment and Water Balance Study
5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario

WSP Canada Inc. is pleased to submit the attached report to document the Hydrogeological Assessment and Water Balance Study prepared for a proposed subdivision development at 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario.

The report provides an assessment of the existing hydrogeological conditions beneath the Site as well as water budgets for existing and future conditions to illustrate the likely changes in water balance that would be expected due to the proposed development. The post-development water budget considers the influence of the stormwater management system that has been proposed to mitigate potential impacts of introducing impervious surfaces. This report also provides estimates of the potential impacts of dewatering for construction and long-term drainage of foundation drains.

Thank you for the opportunity to carry out this study on your behalf. We trust that this information is sufficient for your current needs. If you have any questions or require further information, please contact us.

Yours truly,

Lloyd Lemon, P.Geo., M.Sc.
Senior Project Geoscientist
LL/vb

WSP ref.: 161-06960-00
H:\Proj\16\06960-00\105 Hydrogeological Study\Wp\VB - 161-06960-00 Hydrogeological Study and Water Balance Assessment - FINAL - 2021-04-28.docx

UNIT 2
126 DON HILLOCK DRIVE
AURORA, ON, CANADA L4G 0G9

T: +1 905 750-3080
F: +1 905 727-0463
wsp.com

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Far Sight Homes to prepare a Hydrogeological Assessment and Water Balance Study for the proposed residential development located at 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario (Site).

The proposed development area lies within the Oak Ridges Moraine physiographic region as defined by Chapman and Putnam (1984). The Oak Ridges Moraine is typically characterized by sand or gravel hills with level tracts of sand between them. The area in and surrounding the Site consists of Kame moraines.

The Site currently contains a wetland along the southern property boundary adjacent to the manmade pond. The wetland is fed by run-off from the Site and discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Based on the stratigraphy observed during the borehole drilling and test pit excavations at the Site and well records from the Ministry of the Environment, Conservation and Parks Water Well Information System, the Site is predominantly underlain by alternating layers of sand and silt with isolated layers of fill, silty sand/sandy silt and clayey silt observed in certain boreholes.

Groundwater elevations measured as part of the bi-monthly monitoring program in April 2017 show the local groundwater flow direction is to the southeast across the Site. The observed groundwater flow directions are interpreted to reflect the local influence of the surface water drainage that ultimately flows into the regional drainage system that drains to Lake Simcoe to the North. Groundwater levels at the Site fluctuated from a seasonal high of 0.2 m bgs (April 2017) to a seasonal low of 4.57 m bgs (October 2016). The seasonal high was observed at OW16-1 which is located in the area of the proposed realigned drainage channel.

The infiltration test conducted in the vicinity of the proposed stormwater management locations showed field saturated hydraulic conductivity values consistent with the observed soils. These soils are considered to be capable of supporting design infiltration rates between 40 mm/hour and 51 mm/hour in the sand and gravel, and between 16 mm/hour and 23 mm/hour in the silty clay, with a safety factor of 2.5.

In-situ hydraulic conductivity testing was conducted at all six (6) monitoring wells on June 30, 2016. The results of these test indicate that the hydraulic conductivity of the soil at the Site range from 1.47×10^{-5} m/sec to 1.17×10^{-4} m/sec. These results are consistent with the observed soil descriptions of medium to fine sand in which the monitoring wells are screened.

Representative samples of groundwater were collected from six (6) monitoring wells on June 30, 2016. The results of the tests indicated that parameter concentrations are less than the Ministry of the Environment, Conservation and Parks (MECP) Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for All Types of Property Use (Coarse Textured Soil).

The Climate-Based Water Budget indicates that average annual precipitation over the past 30 years is 857.7 mm/year. The available moisture surplus at the Site ranges between 283.9 mm/yr and 301.9 mm/year depending on the type of soil and vegetation cover. The moisture surplus will reflect the infiltration and runoff based on the soil properties, slopes, and vegetation within individual catchments.

Under existing conditions, there are two (2) on-site catchments and three (3) off-site catchment. Runoff generated on-site outlets at two (2) different locations.

(a) Runoff from the majority of the Site is directed to the drainage ditch which connects to the existing wetland and discharges over the southern property boundary via a culvert underneath Lakeshore Road.

(b) Runoff from a small portion of the site located in the southwest corner flows off-site to the south via overland flow.

The Pre-Development Water Budget reflects infiltration for the Site of approximately 61,037 m^3/yr and runoff from the Site of approximately 20,670 m^3/yr.

The Post-Development Water Budget reflects changes in land use to include increased areas of impervious surfaces (i.e. roads, buildings etc.) and re-grading. Under the proposed development conditions there are 14 on-site catchments and three (3) off-site catchments. Runoff from the developed areas of the Site are directed to rear lot bioswales and to three (3) different StormTech infiltration chambers while the remainder is conveyed to the drainage channels by the proposed storm sewers and/or overland flow. Runoff directed to the drainage channels flows to the existing wetland and is discharged off-site via the culvert underneath Lakeshore road.

The Post-Development Water Budget predicts a total on-site infiltration of 76,100 m^3/yr. Of the total infiltration, 46,804 m^3/yr infiltrates through pervious areas and 29,296 m^3/yr infiltrates as a result of runoff from developed areas being directed to the rear lot bioswales and on-site infiltration chambers. Overall, this is an increase of 25 % relative to the Pre-Development case, and represents an infiltration surplus of 15,063 m^3/yr. At this time, additional mitigation measures are not required as there is an infiltration surplus.

The Post-Development Water Budget predicts a net runoff of 36,293 m^3/yr over the Site area. This is an increase of 80.8% or 16,703 m^3/yr relative to the Pre-Development case. The estimated runoff exiting the Site via the wetland and culvert is predicted to increase by 49% and the runoff directed off-site to the southwest will decrease by 100%.

The Site lies within an area designated as Wellhead Protection Area (WHPA-Q). Policies in the Source Protection Plan for the Lakes Simcoe and Couchiching Source Protection Area for WHPA-Q require that recharge be maintained or enhanced. The water balance calculations demonstrate that the development, as proposed with the stormwater management design as prepared by Sabourin Kimball & Associates Ltd. (2021), will enhance the pre-development infiltration and hence, complies with these policies.

The majority of the Site is not within a mapped Significant Groundwater Recharge Area (SGRA). A small portion of the southeast corner of the site that has already been developed is shown to have high sensitivity. The proposed development design provides for a relatively minor increase in net off-site run-off and enhancement of on-site recharge. This is not anticipated to negatively impact the features protected by the SGRA policy areas.

The majority of the central and east part of the Site is mapped as a Highly Vulnerable Aquifer (HVA) under the Assessment Report for the Lakes Simcoe and Couchiching Source Protection Area as well as the Oak Ridges Moraine Conservation Plan. The proposed land use as residential is expected to have minimal potential to affect underlying groundwater resources.

The foundations for the residential buildings are proposed to be above the seasonally high water table by at least 0.7 m. Dewatering requirements during construction of the building foundations will be minimal, if any. The building foundations could potentially be constructed without registration on the EASR and foundation drainage would not occur year round and may only occur in response to precipitation events.

Some of the utilities proposed for the residential development will be below the seasonally high water table. Conservative estimates of the rate of dewatering during construction support that the project be registered on the EASR and that construction dewatering be managed by staging and seasonal planning to be less than 400,000 L/day. Actual dewatering rates experienced during construction may be substantially lower than the conservative estimates. The utilities are to be constructed with low-permeability seals within the backfill below the seasonally high water table to minimize the potential for drainage of water or potential movement of contaminants within the excavated trenches.

SIGNATURES

PREPARED BY

Valyn Bernard, P.Eng.
Project Engineer

REVIEWED BY

Lloyd Lemon, P.Geo., M.Sc.
Senior Project Geoscientist

WSP Canada Inc ("WSP") prepared this report solely for the use of the intended recipient, FAR SIGHT HOMES, in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

The intended recipient is solely responsible for the disclosure of any information contained in this report. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report.

WSP has provided services to the intended recipient in accordance with the professional services agreement between the parties and in a manner consistent with that degree of care, skill and diligence normally provided by members of the same profession performing the same or comparable services in respect of projects of a similar nature in similar

circumstances. It is understood and agreed by WSP and the recipient of this report that WSP provides no warranty, express or implied, of any kind. Without limiting the generality of the foregoing, it is agreed and understood by WSP and the recipient of this report that WSP makes no representation or warranty whatsoever as to the sufficiency of its scope of work for the purpose sought by the recipient of this report.

In preparing this report, WSP has relied in good faith on information provided by others, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

Benchmark and elevations used in this report are primarily to establish relative elevation differences between the specific testing and/or sampling locations and should not be used for other purposes, such as grading, excavating, construction, planning, development, etc.

WSP disclaims any responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions /or costs.

Design recommendations given in this report are applicable only to the project and areas as described in the text and then only if constructed in accordance with the details stated in this report. The comments made in this report on potential construction issues and possible methods are intended only for the guidance of the designer. The number of testing and/or sampling locations may not be sufficient to determine all the factors that may affect construction methods and costs. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

Overall conditions can only be extrapolated to an undefined limited area around these testing and sampling locations. The conditions that WSP interprets to exist between testing and sampling points may differ from those that actually exist. The accuracy of any extrapolation and interpretation beyond the sampling locations will depend on natural conditions, the history of Site development and changes through construction and other activities. In addition, analysis has been carried out for the identified chemical and physical parameters only, and it should not be inferred that other chemical species or physical conditions are not present. WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off-Site.

The original of this digital file will be kept by WSP for a period of not less than 10 years. As the digital file transmitted to the intended recipient is no longer under the control of WSP, its integrity cannot be assured. As such, WSP does not guarantee any modifications made to this digital file subsequent to its transmission to the intended recipient.

This limitations statement is considered an integral part of this report.

TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 Objectives and Scope 1

1.2 Analysis and Documentation 2

2 REGIONAL SETTING 3

2.1 Physiography 3

2.2 Drainage 3

2.3 Regional Geology 3

2.4 Regional Hydrogeology 4

2.4.1 Regional Groundwater Movement 5

3 WORK PERFORMED 6

3.1 Background Review of Geological Conditions 6

3.2 BoreHole Drilling and Test Pit Excavation 6

3.3 Monitoring Well Installation 7

3.4 Infiltration Testing 7

3.5 Groundwater Level Measurements 7

3.6 Well Development 8

3.7 Single-Well Hydraulic Response Test 8

3.8 Water Quality 8

3.9 Water Budget Analysis 8

3.9.1 Analysis of Climate Data 9

3.9.2 Pre-Development Water Budget 10

3.9.3 Post-Development Water Budget 11

3.10 Dewatering Volume Estimates 11

4 OBSERVATIONS 12

4.1 Soil Profile 12

4.2 Groundwater Elevations 12

4.3 Infiltration Testing 13

4.4 Water Use 13

4.4.1 MECP Water Well Search 13
4.5 Single-Well Hydraulic Response Tests 13
4.6 Water Quality 14
5 WATER BUDGET ANALYSIS 15
5.1 Climate-Based Water Budget 15
5.2 Pre-Development Water Budget 15
5.2.1 Pre-Development Catchments 15
5.2.2 Pre-Development Analysis 16
5.2.3 Pre-Development Infiltration 16
5.2.4 Pre-Development Runoff 16
5.3 Water Budget– Post-Development Conditions 17
5.3.1 Post-Development Catchments 17
5.3.2 Post-Development Analysis 19
5.3.3 Post-Development Infiltration 19
5.3.4 Post-Development Runoff 19
5.3.5 Comparison with Pre-Development 19
5.4 Water Quality 20
5.4.1 Existing Conditions 20
5.4.2 Future Conditions 20
6 POLICY AREAS 21
6.1 Wellhead Protection Areas 21
6.2 Significant Groundwater Recharge Areas 21
6.3 Highly Vulnerable Aquifers 21
7 DEWATERING ASSESSMENT 22
7.1 Dewatering Equations 22
7.2 Assumptions 23
7.3 Dewatering Calculations 24
7.3.1 Construction Dewatering For Residential building Foundations 24
7.3.2 Long-Term Drainage 25
7.3.3 Construction Dewatering For Installation of Utilities 26

7.3.4 Construction Dewatering For Installation of StormTech Infiltration Chambers 28

7.4 Dewatering Summary 29

8 CONCLUSIONS 31

9 REFERENCES 33

TABLES

TABLE 1	MONITORING WELL CONSTRUCTION DETAILS
TABLE 2	INFILTRATION TEST SUMMARY
TABLE 3	GROUNDWATER CHEMISTRY
TABLE 4	CLIMATE BASED WATER BUDGET SUMMARY
TABLE 5	WATER BALANCE SUMMARY WITH MITIGATION
TABLE 6	CONSTRUCTION DEWATERING ESTIMATES SUMMARY – RESIDENTIAL BUILDING FOUNDATIONS
TABLE 7	LONG-TERM DRAINAGE DEWATERING ESTIMATES SUMMARY – RESIDENTIAL BUILDING FOUNDATIONS
TABLE 8	CONSTRUCTION DEWATERING ESTIMATES SUMMARY – STORM AND SANITARY SEWERS
TABLE 9	CONSTRUCTION DEWATERING ESTIMATES SUMMARY – STORMTECH INFILTRATION CHAMBERS

FIGURES

FIGURE 1	SITE LOCATIONS
FIGURE 2	EXISTING CONDITIONS
FIGURE 3	PROPOSED DEVELOPMENT
FIGURE 4	REGIONAL PHYSIOGRAPHY
FIGURE 5	REGIONAL TOPOGRAPHY AND DRAINAGE
FIGURE 6	REGIONAL SURFICIAL GEOLOGY
FIGURE 7	BEDROCK GEOLOGY
FIGURE 8	OVERBURDEN THICKNESS
FIGURE 9	MECP WATER SUPPLY WELLS
FIGURE 10	GROUNDWATER ELEVATIONS
FIGURE 11	PRE-DEVELOPMENT SITE CATCHMENT AREAS
FIGURE 12	POST-DEVELOPMENT SITE CATCHMENT AREAS
FIGURE 13	WELLHEAD PROTECTION AREAS
FIGURE 14	HIGHLY VULNERABLE AQUIFERS

FIGURE 15 SIGNIFICANT GROUNDWATER RECHARGE AREAS
FIGURE 16 OAK RIDGES MORAINE AQUIFER VULNERABILITY
FIGURE 17 BUILDING FOOTPRINTS ABOVE AND BELOW GROUNDWATER ELEVATIONS
FIGURE 18 SANITARY SEWER PIPES ABOVE AND BELOW GROUNDWATER ELEVATIONS
FIGURE 19 STORM SEWER PIPES AND STORMTECH LID STRUCTURES ABOVE AND BELOW GROUNDWATER ELEVATIONS
FIGURE 20 CROSS SECTION A-A'
FIGURE 21 CROSS SECTION B-B'

APPENDICES

A STORMWATER MANAGEMENT PLAN
B MECP WATER WELL RECORDS
C BOREHOLE AND TEST PIT LOGS
D INFILTRATION TEST RESULTS
E BI-MONTHLY MONITORING
F IN-SITU HYDRAULIC CONDUCTIVITY TESTING
G WATER QUALITY
H CLIMATE BASED WATER BUDGET
I WATER BUDGET CALCULATIONS – PRE-DEVELOPMENT
J WATER BUDGET CALCULATIONS – POST DEVELOPMENT
K DEWATERING ESTIMATES – UTILITIES

1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Alcorn & Associates Limited on behalf of Far Sight Homes to prepare a Hydrogeological Assessment and Water Balance Study for the proposed subdivision development located at 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario, herein referred to as the Site. The location of the Site is shown on **Figure 1**. WSP understands that the storm drainage plans have been revised since the last submission in 2018 to reflect a reduction in infiltration volumes in the proposed low impact development (LID) features. Comments were also received from a peer review completed by R.J.Burnside. The revised Hydrogeological Assessment and Water Balance Study reflect these changes and addresses the comments provided by R.J.Burnside.

The Site is located approximately 430 m east of Highway 48 and approximately 200 meters south of Aurora Road in Ballantrae, Ontario. The Site is approximately 26.9 hectares (66.5 acres) in size, rectangular in shape, and is currently occupied by agricultural fields, wooded areas, uncultivated land, three (3) residential dwellings and a pond in the southeast corner. The existing conditions at the Site are shown in **Figure 2** and the development plans provided by WSP are included in **Appendix A**.

The proposed development conditions are shown in **Figure 3** and have been included in **Appendix A**. Under post-development conditions, the Site will include 142 residential lots draining to a series of rear lot bioswales, StormTech infiltration chambers and the on-site creek that flows through the center of the Site and is proposed to be re-aligned as part of the development.

This report documents the work performed to provide an understanding of the hydrogeological conditions at the Site, to prepare a water balance, and to provide preliminary recommendations for Site design and construction.

1.1 OBJECTIVES AND SCOPE

The need for a Hydrogeological Assessment and Water Balance Study was identified to help support the development application process and to quantify changes in Site runoff, infiltration and evapotranspiration between the pre- and post-development conditions for the development plan.

The Hydrogeological Assessment and Water Balance Study has been designed to:

- Review historical information and integrate findings.
- Identify the inventory of groundwater users within 500 m of the property.
- Confirm groundwater flow directions and patterns.
- Confirm and identify potential watershed divides, if any, which control groundwater flow.
- Characterize the water quality of the shallow groundwater.
- Characterize the relationships between on-site groundwater flow systems and adjacent surface water bodies.
- Create an annual water budget for the existing conditions at the property for use as a baseline.
- Determine a future annual water budget for the proposed development scenario.
- Identify significant changes to the water balance or to the form and function of the groundwater or surface water systems that might result from future plans and provide recommendations for mitigative measures to address these changes.
- Prepare a project report.

This iteration of the report has been expanded to assess potential impacts of dewatering associated with construction of proposed structures and buried utilities.

1.2 ANALYSIS AND DOCUMENTATION

The following published information and mapping was reviewed and considered in our analysis of the Site:

Shallow Subsurface Soil Investigations, Proposed Residential Development, 5452 Lakeshore Road, Community of Ballantrae, Project 141-15539-00, WSP, May 2014.

Updated Water Balance Assessment, 5452 Lakeshore Road, Whitchurch-Stouffville, January 2016.

Hydrogeological Assessment – 5452 Lakeshore Road, WSP, January 2016.

Hydrogeological Assessment and Water Balance Study – 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario, WSP, August 2018

Hydrogeological Assessments - Conservation Authority Guidelines to Support Development Applications, April 2013.

Assessment Report, South Georgian Bay Lake Simcoe Source Protection Region, Part 1 (Lake Simcoe, May 2015 update). Approved Lakes Simcoe and Couchiching Source Protection Plan.

Ministry of the Environment, Conservation and Parks (MECP) Water Well Information System (MECP WWIS);

Other sources of information as listed in Section 8.0.

2 REGIONAL SETTING

2.1 PHYSIOGRAPHY

The regional physiography for the Site area is shown in **Figure 4**. The proposed development area lies within the Oak Ridges Moraine physiographic region as defined by Chapman and Putnam (1984). The Oak Ridges Moraine consists of sand or gravel hills with level tracts of sand between them. The landforms in the area within and surrounding the Site consist of kame moraines.

2.2 DRAINAGE

Regional topography is illustrated on **Figure 5**. The topography of the Site is generally sloping toward the center and south of the property. The topography at the Site has elevation that ranges from 331 metres above sea level (m asl) to 334 m asl. The topography is generally higher to the north and along the west and east edges and lower in the center and to the south edge of the Site.

The Site is located approximately 2.1 km north of the divide between the Lake Simcoe Watershed and the Lake Ontario Watershed.

The Site currently contains a wetland along the southern property boundary adjacent to the manmade pond. The wetland is fed by run-off from the Site and discharges off-site to through the southern property boundary via a culvert underneath Lakeshore Road. The area of the pond is not within the current boundary of the proposed development.

Although local drainage is directed to the south, the regional drainage system flows to the north to Lake Simcoe.

2.3 REGIONAL GEOLOGY

The near surface soils are the top unit in a layered sequence of glacial and interglacial sediments that comprise the stratigraphic profile overlying bedrock beneath the Lake Simcoe region. The distribution of surficial soil types in and around the Site are shown on **Figure 6**. The surficial soils at the Site are predominantly characterized by sand deposits. The deposits and stratigraphy for the regional area are described in a series of papers and posters prepared by the Geological Survey of Canada under the direction of Dr. David Sharpe.

The stratigraphic profile beneath Oak Ridges Moraine area typically includes the following layers, from youngest to oldest:

1. Recent deposits.
2. Oak Ridges Moraine (ORM) Sediments
3. Newmarket Till.
4. Thorncliffe Formation.
5. Sunnybrook Drift.
6. Scarborough Formation.
7. Don Formation.
8. York Till.
9. Bedrock.

The Site area is located within the ORM Area and some of these deposits may not all be observed at this location.

The ORM sediments are a complex package of granular sediments deposited in the meltwater at the later stages of the last glacial period, which serve as the topographic and groundwater divide between Lake Simcoe and Lake Ontario. These deposits generally become finer, and typically become thinner and eventually pinch out away from

the original outlets of meltwater. Certain areas with the ORM sediments may be overlain by a thin layer of Halton Till.

The Newmarket Till represents a regionally extensive stratum that is associated with the most recent period of glaciation. This till is typically dense to very hard and sandy to silty in texture with relatively low gravel content.

The stratigraphic layers between the Newmarket Till and the underlying bedrock are commonly grouped as the Lower Sediments. The Lower Sediments are considered to have been formed by similar cycles of earlier glacial advances and retreats and associated meltwater events that resulted in the deposition of the Newmarket Till and Oak Ridges Moraine sediments. Five (5) stratigraphic layers that constitute the Lower Sediments are described below, although not all are interpreted to occur below the study area.

The Thorncliffe Formation is a complex of stratified glaciofluvial and glaciolacustrine deposits. The texture of the Thorncliffe Formation is highly variable and is best described as fine-grained, with interbedded coarse-grained material capable of yielding notable amounts of water.

The Sunnybrook Drift is a fine-grained material deposited in glacial and proglacial lacustrine depositional environments (diamicton). The advance of the ice sheet blocked the main drainage from the regional basin, which caused water levels to rise and form a deep lacustrine environment with deposits including varved clays.

The Scarborough Formation is a coarsening upward sequence of sediment that ranges from clay/silt rythmites (fine-grained) to channelized cross-bedded sands (coarse-grained). The coarser fractions of this delta are a potential source of groundwater.

The Don Formation is only rarely preserved within southern Ontario and consists of alternating beds of fossiliferous sand and mud.

The York Till was deposited immediately overlying the bedrock by the preceding Illinoian glaciation. This till occurs only sporadically within the study area and is believed to be preserved in lows upon the bedrock surface. The till is dark grey with a sandy silt matrix and includes clusters of the underlying shale.

The bedrock in the study area is mapped as shale/limestone/dolostone/siltstone of the Blue Mountain Formation (Brennand et al., 1998) as illustrated on **Figure 7**. The depth to bedrock is estimated to be between 80 to 85 metres below ground surface, based on bedrock topography mapping and topographic mapping of the ground surface (Gao et al., 2006). A map of overburden thickness is provided in **Figure 8**. The thickness of overburden is typically greatest along the crest of the Oak Ridges Moraine or in areas where there are topographic lows in the underlying bedrock surface.

2.4 REGIONAL HYDROGEOLOGY

The movement of groundwater through the subsurface is controlled by the hydraulic gradients and the relative distribution of coarse and fine-grained sediments. In general, water will move laterally through coarse-grained sediments (sands and gravels) and vertically through fine-grained sediments (silts and clays). As such, the geologic units are typically grouped into hydrostratigraphic units that reflect the capacity of the geologic units to transmit water. Hydrostratigraphic units are considered to be either aquifers (with good capacity to transmit water) or aquitards (which typically impede transmission of water). Ultimately the distribution and interconnection of aquifers and aquitards are responsible for observed groundwater movement.

Earthfx Inc. (2006) grouped the regional stratigraphic profile into a seven-layer hydrostratigraphic profile as follows:

1. Recent Deposits
2. Oak Ridges Aquifer Complex (ORAC).
3. Newmarket Aquitard.
4. Thorncliffe Aquifer Complex.
5. Sunnybrook Aquitard.
6. Scarborough Aquifer Complex.
7. Bedrock.

The Oak Ridges Aquifer Complex is a regional aquifer system in Ontario that corresponds to the area where the Oak Ridges Sediments are deposited. The aquifer is a significant source of groundwater for domestic, commercial, industrial, institutional, agricultural, and municipal water supplies. The ORAC provides baseflow to the headwaters of creeks and rivers where the Halton Aquitard is absent. The shallow water table will typically be observed within this layer. The ORAC is present at the Site.

The Newmarket Aquitard consists of the Newmarket Till and low permeability deposits that are known to infill the erosional channels. The Newmarket Aquitard is considered to be a leaky confining layer that provides protection from contamination to aquifers within the underlying hydrostratigraphic units. The Newmarket Aquitard may be present at ground surface beneath the southern part of the Site.

The Thorncliffe Aquifer Complex consists of fine to coarse-grained sediments of the Thorncliffe Formation. Local sand and gravel deposits within the Thorncliffe Aquifer Complex provide high yield wells. Groundwater in this layer is typically under pressure and in areas to the south of Aurora, the groundwater is under artesian pressure which can result in flowing wells.

The Sunnybrook Aquitard separates the Thorncliffe and Scarborough Aquifer Complexes. This aquitard demonstrates low permeability, provides some resistance to vertical groundwater movement, and protects the underlying aquifer from potential contaminant movement.

The Scarborough Aquifer Complex consists of fine to coarse-grained sediments associated with the Scarborough Formation. In general, these sediments tend to be coarse-grained and thicker where they fill topographic lows and valleys in the underlying bedrock surface. Groundwater within the Scarborough Aquifer Complex is typically under pressure, but only local artesian conditions occur. Locally, the Scarborough Aquifer Complex produces high well yields suitable for municipal or commercial wells. Due to its depth and presence of shallower aquifers, the Scarborough Aquifer Complex is not exploited extensively for private water supplies.

2.4.1 REGIONAL GROUNDWATER MOVEMENT

In general terms, precipitation infiltrates vertically into the surficial sand/gravel soil units. Groundwater will primarily move downward to the water table within the upper aquifer or aquitard unit. Groundwater will then tend to flow up or down through the aquitard units and laterally within the aquifers. Groundwater flow patterns can be influenced by established watercourses where there is potential for groundwater discharge to supply baseflow into the watercourses. The rate of groundwater discharge is controlled by the relative permeability of the recent deposits at the base of the streams. Discharge as baseflow is typically low through fine-grained base soils and higher where the streams have eroded down into coarser aquifers.

The horizontal groundwater movement through the subsurface aquifers tends to reflect the ground surface topography and the presence of stream channels.

3 WORK PERFORMED

The work program for the Hydrogeological Assessment and Water Balance Study included the following activities:

1. Description of the natural Site conditions: surface features, surface topography, soil types and stratigraphy.
2. Identification of current users of groundwater within 500 m of the subject property through the review of the MECP WWIS.
3. Installation of six (6) groundwater monitoring wells at various locations throughout the Site to supplement the monitoring well network from earlier studies (WSP, 2014-2016).
4. Infiltration testing at four (4) test pit location, to determine field saturated hydraulic conductivity in the vicinity of proposed StormTech Infiltration chambers.
5. Monitoring of groundwater quality and elevations in the monitoring well network.
6. Single-well response tests on the six (6) monitoring wells to determine the relative horizontal hydraulic conductivity of saturated soils adjacent to the well screen.
7. Preparation of an annual climatic water budget and Site-specific water balance for Pre and Post-Development conditions.
8. Estimation of the potential rates of dewatering associated with construction of proposed structures and utilities, and for potential rates of long-term foundation drainage.

3.1 BACKGROUND REVIEW OF GEOLOGICAL CONDITIONS

The geologic conditions beneath the proposed development were reviewed using published map sources, records from work on adjacent properties, and the WWIS database as maintained by the MECP.

Water well records within a 500-metre radius of the Site were reviewed to obtain information on existing wells and to provide information on the geology of the area. A summary of the well record search is provided in Table B-1, **Appendix B** and water well record locations are plotted on **Figure 9**.

In addition, stratigraphy information from WSP's previous Hydrogeological Assessment (WSP, 2016) for 5452 Lakeshore Road was incorporated as part of the background review. Six (6) monitoring wells (MW15-1 to MW15-6) and six (6) test pits (TP14-01 to TP14-06) were completed as part of the previous Hydrogeological Assessment for 5452 Lakeshore Road. The locations of these boreholes and test pits are shown on **Figure 2**.

3.2 BOREHOLE DRILLING AND TEST PIT EXCAVATION

Ontario One Call was consulted to identify where existing public utilities entered the Site boundaries prior to initiating on-site activities. In addition, given that the Site is a private property, WSP retained the services of a private utility locator to clear the specific borehole and test pit locations from potential interference with private utilities.

The borehole drilling and monitoring well installation was carried out between May 30 and June 3, 2016 while the test pits were excavated on June 27, 2016, after the receipt of utility clearances. Drilling and excavation services were provided by Strata Soil Sampling of Mount Albert, Ontario and Burns Brothers Excavating of Stouffville, Ontario, respectively. A Geoprobe® model 782DT direct push rig was used for borehole drilling and monitoring well installation. A WSP technician was on-site to supervise the drilling, monitor installation and test pit activities.

The borehole and test pit locations are shown on **Figure 2**. The drilling program consisted of installing six (6) monitoring wells, designated as OW16-1 to OW16-6, to depths ranging from 5.2 m and 6.1 m below ground surface (bgs). An additional five (5) boreholes, designated as BH16-1 to BH16-5, were advanced to a depth of 8.1m bgs in support of the Geotechnical Investigation (WSP, 2018). Four (4) test pits, designated TP16-1 to TP16-4 were also excavated to depths ranging from 3.00 m to 3.20 m bgs and were used to conduct infiltration testing for proposed StormTech Infiltration Chambers (Section 3.4). Records of the observed stratigraphy in the boreholes and test pits are provided in **Appendix C**.

3.3 MONITORING WELL INSTALLATION

The positions of the monitoring well screens in OW16-1 to OW16-6 were determined based on the observed soil profile and were targeted to correspond with identified sandy or wet and more permeable layers of the soil within the upper 7 m of ground surface. This depth was determined based on observations from past investigations in the area.

The monitoring wells were constructed upon reaching the target depth in the direct push boreholes. The wells were constructed in individual boreholes using 52 mm (2 inch) inside nominal diameter (ID), schedule 40, environmental grade PVC riser pipes and well screens. The well screens are factory slotted with No. 10 slot size, and are 3.05 m (10 feet) long. The wells were constructed to leave the PVC riser pipe between 0.84 and 0.88 m above ground surface.

The borehole annulus around the well screens were filled with No. 2 silica sand to approximately 0.6 m above the top of the well screen to provide a filter pack. A low-permeability seal was placed above the filter pack using bentonite pellets. A 1.5 m long, lockable, steel, protective casing was placed over the PVC riser pipe.

The monitoring well installations were completed to O. Reg. 903 standards and a well tag was submitted to the MOE by the licensed driller for each individual well. The monitoring well construction details are summarized in **Table 1** and on borehole records provided in **Appendix C**.

3.4 INFILTRATION TESTING

The field work associated with the infiltration testing was carried out on June 27, 2016. Four (4) test pits were excavated to a depth of 1 and 2 m at each location. The testing depths and locations were predetermined based on proposed stormwater management locations provided by Sabourin Kimble & Associates Ltd (SKA). Two of the test pits were excavated in the western proposed stormwater management block and two of the test pits were excavated in the east stormwater management block. Infiltration tests were conducted in each test pit using a 4" Pask Permeameter to measure the rate at which water is taken into the soil. A graphical method was then used to estimate the percolation rate or infiltration rate associated with the soils. The testing depths are summarized in **Table 2**.

During testing, records were maintained of the soil profile observed and the depth to water (if observed) and are shown in Table D-1 through D-8 in **Appendix D.** Upon completion of testing, the test pits were back-filled and restored to the original condition. The test pit locations are shown on **Figure 2.**

3.5 GROUNDWATER LEVEL MEASUREMENTS

Observations during the drilling OW16-1 to OW16-6 confirmed that the water table is relatively shallow beneath the Site. The well screen intervals were placed at depth in stratigraphic positions that were considered to have potential to yield water.

The depth to groundwater was measured in monitoring wells and were observed in the test pit excavations. Static groundwater elevations were estimated by subtracting the measured water depth from the determined reference elevation at each monitoring well. The groundwater elevations in OW16-1 to OW6-6 were measured immediately after construction and in May and June 2016.

A bi-monthly monitoring program was implemented in June 2016 to record groundwater levels at the Site every two (2) months for a period of one (1) year. The purpose of the bi-monthly monitoring program was to characterize seasonal variations in groundwater level and to determine the seasonal high groundwater level. In addition to recording water levels at wells installed as part of this investigation, water levels at the pre-existing wells from the original Hydrogeological Assessment for 5452 Lakeshore Road (WSP, 2016) were recorded. A summary of groundwater elevations is provided in Table E-1 of **Appendix E**.

3.6 WELL DEVELOPMENT

The monitoring wells were developed after installation to remove silt and sediment. The purpose of development is to ensure that representative formation water is obtained for water quality analysis.

The volume of water in the well casing was estimated based on the static groundwater level measurement. A dedicated Waterra™ Inertial pump was installed in the monitoring well and used to remove water from the well. Standing water was observed in all six (6) monitoring wells.

3.7 SINGLE-WELL HYDRAULIC RESPONSE TEST

Single well hydraulic response tests were performed to estimate the saturated hydraulic conductivity of the soil materials adjacent to the well screens in the six (6) monitoring wells on June 30, 2016. For this program, the single well hydraulic response test consisted of monitoring the recovery of the water level to the static position after pumping the monitoring well for a specified period of time. One (1) test was performed on each well. Prior to the start of the tests, the static water level was measured in each monitoring well. For all single-well hydraulic response tests, the water level within the monitoring wells returned to the static level within a few minutes.

The hydraulic conductivity was estimated from the data using the methods of Hvorslev (1951). The computer program AquiferTest™ was used to assist in estimating hydraulic conductivity results. Analysis results are included in **Appendix F**.

3.8 WATER QUALITY

Representative samples of groundwater were collected from the six (6) monitoring wells on June 30, 2016. A duplicate sample was taken for QA/QC purposes. Samples were collected via the dedicated Waterra™ inertial pump placed in the monitoring well. Field measurements of temperature, electrical conductivity, and pH were recorded at the time of sample collection. The water samples were collected in sample bottles prepared by and provided by ALS Environmental Laboratories (ALS) located in Waterloo, Ontario.

The water quality samples were submitted to determine concentrations of:

General water quality parameters (major cations, major anions, pH)

Dissolved Metals

Dissolved Organic Carbon

Nutrients.

The Certificates of Analysis provided by ALS are provided in **Appendix G**.

The water quality results were reviewed with respect to Table 2: Full Depth Generic Site Condition Standards (SCS) in a Potable Ground Water Condition for All Types of Property Use (Coarse Textured Soil), hereinto referred to as the “MECP Table 2 SCS”, as outlined in the Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (April 15, 2011). This table was selected as it provides a conservative assessment of potential water quality concerns in groundwater as the area surrounding the Site is serviced by municipal water supplies.

3.9 WATER BUDGET ANALYSIS

A Water Budget provides an accounting of the water inputs and water outputs within a defined area. In this case, the area of the proposed development is used to estimate the water budgets in the existing condition (Pre-Development) and in the future condition (Post-Development).

The basic assumption of a water budget analysis is that there is a balance between water inputs and outputs, unless there is a clear understanding that water is being removed from storage within the system. The water budget is typically represented in a simple form as:

Water In = Water Out

P + EI = ET + IR + RO + EO

Where:

P	=	Precipitation
EI	=	External Inputs (including run-on, irrigation, and vertical/lateral transfers)
ET	=	Evapotranspiration
IR	=	Infiltration Recharge
RO	=	Runoff
EO	=	External Outputs (including water taking, and vertical/lateral transfers)

In more complex scenarios, lateral inputs through groundwater and surface water, movement between subsurface aquifer layers, and removal from storage can also be considered.

The objectives of the Water Budget Analysis are to:

a) quantify the water budget equation for the existing conditions;
b) quantify the water budget equation for proposed future conditions; and
c) illustrate that there is either no significant change (i.e. a water balance) between the existing or future conditions, or that mitigation methods can be employed to minimize the estimated change.

The Water Budget Analysis was completed in three (3) main steps:

Step 1) Analysis of Climatic Data;

Step 2) Pre-Development Water Budget; and

Step 3) Post-Development Water Budget (including mitigation).

A previous iteration of the Water Balance Study identified potential infiltration deficits that were subsequently addressed by the current stormwater management plan. In this case, Steps 3 and 4 were combined. The water budget analysis follows methods outlined in "Hydrogeological Technical Information Requirements for Land Development Applications" (MECP, 1995).

3.9.1 ANALYSIS OF CLIMATE DATA

Climate data available from on-line resources maintained by the Meteorological Service of Canada (Environmental Canada) were obtained and analyzed to determine the appropriate values for annual average precipitation and evapotranspiration. The surplus left over after subtraction of the evapotranspiration from the average precipitation is considered to represent the quantity of water available for infiltration and runoff under existing conditions.

Climate data was obtained for the King Smoke Tree Climate Station for the period from 1981 until 2010. These data are provided in Table H-1, **Appendix H**. Mean monthly temperatures were calculated by averaging mean monthly minimum and maximum temperatures. Temperature data were derived from the 30 year (1981-2010) climate data summaries.

The Thornthwaite-Mather method was used to estimate potential and actual evapotranspiration on a monthly basis. The Thornthwaite-Mather method is based on an empirical relationship between potential evapotranspiration and mean air temperature. The method also takes into account the water holding capacity for the soil to compute the actual evapotranspiration and the resulting moisture surplus that is available for infiltration and runoff.

The water holding capacity of the soil depends on two different factors – the soil type and structure, and the type of vegetation growing on the surface. Different types of soil hold different amounts of moisture storage capacity, while different species of vegetation will send roots into the soil to different depths and therefore retain varying amounts

of moisture. The water holding capacity for each soil type/vegetation type combination found on the Site was determined from the Environmental Design Criteria of the Storm Water Management Planning and Design Manual published by the MECP in 2003.

The monthly estimates were used to calculate an annual average for precipitation, potential evapotranspiration, actual evapotranspiration, and available moisture surplus for each combination of soil and vegetation type found on-site. The moisture surplus represents the quantity of water available for infiltration and runoff on an annual average basis. Tables that document the details of the Thornthwaite-Mather analysis for the combinations of soil type and land use are provided in **Appendix H.**

3.9.2 PRE-DEVELOPMENT WATER BUDGET

The Pre-Development Water Budget was estimated using the approach recommended in Table 2 of the "Hydrogeological Technical Information Requirements for Land Development Applications" (MECP, 1995). The steps taken to estimate the Pre-Development Water Budget included:

1. Identify sensitive features and to observe existing topography, soil types, and other controls on infiltration and runoff.
2. Delineating drainage catchments and sub-catchments based on observed drainage outlets and physical characteristics as described below.
3. Estimating the quantities of infiltration and runoff for each of the sub-catchment areas and preparing summary estimates for catchments related to identified drainage outlets and for the proposed development area.

The drainage catchments and sub-catchments were defined by considering the following factors:

Existing elevations;

Existing property boundaries;

Post-development features and property boundaries;

Natural topographical features;

Slope ratio; and

Land cover, and

Land use.

The sub-catchments defined for the Pre-Development Water Budget also considered the proposed development areas and future drainage considerations for the proposed development. This was incorporated into the analysis to be able to demonstrate changes in drainage to the identified outlets and infiltration beneath the development area. The defined sub-catchments for the Pre-Development Water Budget are shown on **Figure 11** and in Table I-1, **Appendix I**.

The Infiltration Factor for each Pre-Development sub-catchment was estimated by adding the sub-factors for topography, soil type, and land cover as recommended in the MECP methodology. A geographic information system (GIS) was used to evaluate the topography, soil type and land use for each of the Pre-Development, Current Condition, and Post-Development scenarios and to generate a set of sub-catchments that can be used in analysis of each scenario. Section 6 provides a characterization of the Site in terms of the topography, soil type, and land use as input into the water budget analysis. The calculated infiltration factor for each catchment was reviewed and updated manually, as a confirmation that they reflect actual conditions. Assumptions applied to the Pre-Development water budget scenario are described in Section 5.2.

The volume of Pre-Development Infiltration was estimated as the product of [sub-catchment area] x [moisture surplus] x [Infiltration factor]. The Pre-Development Runoff was estimated by subtracting the volume of infiltration from the total volume of moisture surplus for each sub-catchment. A detailed table to document the calculations of the Pre-development Water Budget is provided in **Appendix I**.

3.9.3 POST-DEVELOPMENT WATER BUDGET

The Post-Development Water Budget was estimated using a similar approach as outlined for the Pre-Development case. The proposed development plan and future drainage plan were used to establish new drainage sub-catchments that relate to the outlets identified in the Pre-Development case. Within each drainage sub-catchment, the area of pervious soils and impervious development (roads, driveways, amenities, and roofs) were estimated based on the Site and grading plans as provided by Sabourin Kimble & Associates Ltd (SKA, 2021).

For the pervious areas, the quantity of infiltration was calculated using the [pervious area] x [precipitation surplus] x [Infiltration Factor]. The Infiltration Factors were reviewed to correspond to the Post-Development conditions. The runoff for the pervious areas was estimated by subtracting the volume of infiltration from the total volume of precipitation surplus for the pervious area in each sub-catchment.

The volume of runoff from the impervious surfaces was estimated using the area of impervious surfaces and the volume of precipitation. A factor of 10% was considered to represent some evaporation in the course of runoff. This value is consistent with assumptions made on adjacent lands.

The Site will be municipally serviced for water and sewage. The Post-Development Water Budget reflects this.

The Post-Development Water Budget was compared to the Pre-Development Water Budget to evaluate the effects of the proposed development. A previous iteration of the Water Balance Study identified potential infiltration deficits that were subsequently addressed by the current stormwater management plan. The Post-Development Water Budget takes into account mitigation measures used to address the infiltration deficit that would exist if no mitigation measures were incorporated. As such, the Post-Development Water Budget did not require subsequent re-estimation to account for mitigation measures.

Details of the Post-Development Water Budget calculations are provided in **Appendix J**.

3.10 DEWATERING VOLUME ESTIMATES

The potential volume of water that may need to be managed during construction dewatering and that may be generated from long-term drainage from constructed structures is estimated in Section 7. The approach and calculation methods are described in Section 7.

4 OBSERVATIONS

The information obtained during previous site studies was reviewed and analyzed to characterize the soil profile and the groundwater system at the Site.

4.1 SOIL PROFILE

Based on the stratigraphy observed during the borehole drilling and test pit excavations, the Site is predominantly underlain by alternating layers of sand and silt with isolated layers of fill, silty sand/sandy silt and clayey silt observed in certain boreholes.

A layer of topsoil ranging from 130 – 360 mm in depth was observed in OW1, OW2, OW5, OW6 and BH16-1 to BH16-5. Topsoil was not observed in OW3 and OW5. The topsoil was underlain by different soil types depending on location and these included: sand, sandy silt, silty sand and clayey silt. Layers of silty sand fill were also identified in BH16-1 and BH16-3 immediately below the topsoil. The first layer of stratigraphy typically extended to a depth of 1.5 – 1.8 m bgs. Below this level, the stratigraphy predominantly consisted of alternating layers of sand and silt of combinations of both down to a maximum depth of 8.1 m bgs.

The stratigraphy observed within the test pits was generally consistent with stratigraphy observed within the boreholes. A layer of topsoil ranging from 150 mm to 300 m was observed within all test pits. Silty sand and fine to medium sand were identified in TP16-1 and TP16-2. A layer of gravelly coarse sand was observed in TP16-2 between 0.70 m and 1.00 m bgs. A layer of sand underlay the topsoil in TP16-3 which was followed by silt. The stratigraphy at TP16-4 differed slightly from the rest of the test pits. The topsoil at this location was underlain by a layer of silty sand followed by layers of clayey silt and silt and clay. A layer of sand extending from 2.50 m bgs to borehole termination underlay the silt and clay in TP16-4.

The stratigraphy observed during the borehole and test pit investigations is generally consistent with the stratigraphy information reported in the water well records obtained through the MECP borehole logs. Table B-1 in **Appendix B** provides a list of water well records. Borehole and test pit logs are provided in **Appendix C**.

4.2 GROUNDWATER ELEVATIONS

Upon completion of drilling, the water level within each monitoring well was observed and recorded. The depth to water ranged from 0.7 m bgs to 3.0 m bgs on May 30 and 31, 2016. Groundwater levels at the Site were subsequently monitored on a bi-monthly basis (every two months) for a period of one year during 2016 and 2017. The results of the monitoring program indicate that that groundwater levels at the Site fluctuate from a seasonal high of 0.2 m bgs (April 2017) to a seasonal low of 4.57 m bgs (October 2016). The seasonal high was observed at OW16-1 which is located in the area of the realigned drainage channel.

Figure 10 presents a map illustrating Groundwater Elevations. The inferred groundwater flow direction based on April 2017 groundwater elevations is to the east across the Site. This inferred flow pattern is somewhat inconsistent with the topography observed at the Site. The monitoring well locations were chosen near the corners of the property and this may reduce the influence of topography and surface water drainage patterns in the center of the Site.

The Site is located north of the regional groundwater divide. The observed groundwater elevations are considered to reflect a local condition related to the shallow drainage that locally flows to the south before turning north to feed the regional groundwater flow system.

4.3 INFILTRATION TESTING

Infiltration tests were conducted in each test pit using a 4" Pask Permeameter to measure the rate at which water is taken into the soil. A graphical method was then used to estimate the percolation rate or infiltration rate associated with the soils. The calculated field saturated hydraulic conductivity using the observed rate of fall and an applicable soil factor is presented in Tables D-1 through D-8. The results of the infiltration testing are summarized in **Table 2**. The results are also presented graphically in Figure D-1.

Figure D-1 shows the observed field saturated hydraulic conductivity estimates and uses relationships published by the "Ministry of Municipal Affairs and Housing – Building Development Branch" to relate the test values to "infiltration rate" (in mm/hour) or "percolation time" (in mins/cm). As can be seen on Figure D-1 – these concepts are inversely related (a low value in one is high for the other).

The field saturated hydraulic conductivity was observed to be range between 2.3 x 10^{-5} and 5.1 x 10^{-5} m/sec in sand and gravel soils, and between 3.5 x 10^{-7} and 2.1 x 10^{-6} m/sec in the silty clay soils. These values are reasonably within the expected range observed for sand and gravel and silty clay soils, respectively. The tests correlates to infiltration rates ranging between 100 mm/hr and 128 mm/hr for the sand and gravel and between 40 mm/hr and 58 mm/hr for the silty clay.

A safety correction factor is typically incorporated into the LID design to ensure that the sufficient conservatism is incorporated to account for variability in field conditions. The typical factor of safety to be used can range between 2 and 3. Typically, a higher factor of safety would require a larger footprint to provide an equivalent volume of infiltration. A safety factor of 2.5 was applied to the estimated infiltration rates. The estimated infiltration rates for design purposes that accounts for the factor of safety of 2.5 would be between 40 mm/hour and 51 mm/hour in the sand and gravel soils, and between 16 mm/hour and 23 mm/hour in the silty clay soils.

4.4 WATER USE

The three (3) residential dwellings located on the Site obtain water from municipal services and have private individual sewage systems. The proposed development will be municipally serviced for water and sewage.

4.4.1 MECP WATER WELL SEARCH

A list of MECP water well records within 500 m of the Site is provided in **Appendix B**. **Figure 9** illustrates the locations of wells located within 500 m of the Site property as per the MECP WWIS. The well record database includes 172 water well records within a 500-metre radius of the Site. Of the well records, 119 are water supply wells for domestic, irrigation, livestock, commercial and public purposes, 23 are test holes or monitoring wells, 26 are abandoned, and five (5) are for other purposes.

Of the 119 water supply wells, 54 draw water from sand lenses at a depth less than 20 m, 54 draw water from sand lenses at depths ranging between 20 and 40 m, and seven (7) draw water from silt, clay and sand lenses greater than 40 m. It is our understanding that this area is now municipally serviced for water. As such, it is likely that many of the domestic water supply wells have been removed from active use.

It is possible that the MECP WWIS database includes other wells that are incorrectly located and there may be some wells for which well records, and particularly records of well decommissioning, are not on file at the MECP.

4.5 SINGLE-WELL HYDRAULIC RESPONSE TESTS

The hydraulic conductivity estimates obtained from the monitoring wells for the single well hydraulic response tests ranged from 1.47 x10^{-5} m/sec to 1.17 x10^{-4} m/sec for the six (6) on-site monitoring wells. The highest and lowest hydraulic conductivity values were observed at OW16-3 and OW16-2 which are located in the southeast corner and

central portion of the Site, respectively. These results are consistent with the observed soil descriptions of medium to fine sand in which the monitoring wells are screened.

The results of the single-well hydraulic response test are summarized in **Appendix F**.

4.6 WATER QUALITY

The results of water quality testing at the six (6) on-site monitoring wells are summarized in **Table 3**. The water quality analysis reports as provided by ALS are presented in **Appendix G**.

The concentrations of the parameters tested are less than the MECP Table 2 SCS values.

5 WATER BUDGET ANALYSIS

The Water Budget Analysis is presented in the following sections. Section 5.1 describes the analysis of historical climate data to estimate annual average precipitation and potential evapotranspiration. Section 5.2 describes the Pre-Development Water Budget. Section 5.3 Describes the Post-Development Water Budget. Section 5.4 revisits the Post-Development Water Budget to consider the potential benefits of identified mitigation opportunities.

5.1 CLIMATE-BASED WATER BUDGET

The climate-based water budget calculations are included in Tables H-1 to H-5 (**Appendix H**) and are summarized in **Table 4**. The average annual precipitation for the thirty year normal data between 1981 and 2010 is about 857.7 mm/m^2/year (mm/year). The annual potential evapotranspiration is calculated in Table H-1 at 583.9 mm/year. This equates to a potential water surplus of 369.9 mm/year and a soil moisture deficit of 96.1 mm/year. Thus the net annual water surplus based on potential evapotranspiration is 273.8 mm/year.

The calculations were expanded to include the water holding capacity of the soil as presented in Tables G-2 to G-4. This will produce a total moisture surplus based on the calculated actual evapotranspiration. Four (4) combinations of soil type and vegetation type were identified on the Site property for the Pre-Development and Post-Development scenarios. The majority of the surficial soil at the site is considered to be silt loam. The land use classifications and the corresponding water holding capacities are:

Silt Loam, Residential Lawn (125 mm/year);

Silt Loam, Cultivated (200 mm/year);

Silt Loam, Uncultivated (250 mm/year); and

Silt Loam, Woodland (400 mm/year).

Consideration of these factors produces a range of net annual moisture surplus between 283.9 and 301.9 mm/year as summarized in **Table 4**. The soils with higher water holding capacity effectively increase the water removed as evapotranspiration.

The calculated moisture surplus occurs during the winter, spring and fall months, and a water deficit occurs during the summer months. Much of the water surplus in the winter accumulates as snow. Snowmelt during the spring results in the runoff or infiltration of precipitation that is effectively equivalent to the winter and spring water surplus.

5.2 PRE-DEVELOPMENT WATER BUDGET

The Pre-Development Water Budget was developed based on topographic information provided by Ontario Base Mapping and the Site Grading Plan provided by SKA (February 2021).

5.2.1 PRE-DEVELOPMENT CATCHMENTS

Figure 11 illustrates the delineation of pre-development drainage catchments and sub-catchments for the Site. The Site is comprised of two (2) internal (on-site) and three (3) external (off-site) catchment areas. The catchment areas have been further subdivided into drainage sub-catchments are based on similar slopes, soils, and vegetation/land use. The drainage sub-catchments also include consideration of post-development drainage boundaries so that changes to drainage areas can be evaluated for the post-development conditions. The outlets for drainage of the identified Pre-Development catchments are as follows:

On-Site Catchments:

Pre-Development On-Site Catchment A: Drains to the existing drainage channel which flows south to the existing wetland. Runoff in the wetland drains off-site through the southern property boundary through a culvert underneath Lakeshore Road.

Pre-Development On-Site Catchment B: Drains off-site to the south via overland flow.

Off-Site Catchment:

Pre-Development Off-Site Catchment C: Drains to on-site sub-catchment A-937 and is directed to the existing drainage channel which flows south to the existing wetland. Runoff in the wetland drains off-site through the southern property boundary through a culvert underneath Lakeshore Road.

Pre-Development Off-Site Catchment D: Drains to on-site sub-catchment A-755 and is directed to the existing drainage channel which flows south to the existing wetland. Runoff in the wetland drains off-site through the southern property boundary through a culvert underneath Lakeshore Road.

Pre-Development Off-Site Catchment E: Drains to on-site sub-catchment A-722 and is directed to the existing drainage channel which flows south to the existing wetland. Runoff in the wetland drains off-site through the southern property boundary through a culvert underneath Lakeshore Road.

Table I-1 (**Appendix I**) provides a summary of the data attributes used to estimate the infiltration factor for each pre-development catchment and sub-catchment. The infiltration factor determined the proportion of the annual water surplus that would infiltrate or runoff within each sub-catchment.

5.2.2 PRE-DEVELOPMENT ANALYSIS

Properties associated with area, slope, soil type, and land cover were analyzed and assigned to each Pre-Development sub-catchment. The values assigned to each Pre-Development sub-catchment are provided in Table I-1. These values were used to estimate an Infiltration Factor. The Infiltration Factors were reviewed to confirm that they are appropriate and adjusted if necessary. Existing paved areas were assumed to be impervious and to generate runoff equivalent to the precipitation volume minus a 10% evaporative loss. Gravel areas were assumed to have a surplus equivalent to that of urban lawn areas.

Table I-1 includes the overall analysis of the total Study Area's infiltration and runoff. Table I-1 also documents the calculation of volumes associated with input and output parameters for the Pre-Development conditions. These volumes are also expressed in terms of the number of mm of water within each sub-catchment area.

A summary of the Pre-Development water budget calculations is provided in **Table 5**. These values will be used to assess the changes that proposed development will create relative to the pre-development conditions.

5.2.3 PRE-DEVELOPMENT INFILTRATION

The estimated total infiltration for the Site is 61,037 m^3/yr or an equivalent of 227 mm/year (mm/m^2/yr). The calculated infiltration represents approximately 26.4% of the annual precipitation (858 mm/yr) and 74.7% of the estimated annual water surplus (303.6 mm/yr).

5.2.4 PRE-DEVELOPMENT RUNOFF

The total runoff for the Site is 20,670 m^3/yr or an equivalent of 227 mm/year. The calculated runoff represents approximately 9.0% of the annual precipitation (858 mm/yr) and 25.3% of the estimated annual water surplus (303.6 mm/yr).

5.3 WATER BUDGET– POST-DEVELOPMENT CONDITIONS

The Post-Development Water Budget was based on the proposed concept plan presented as **Figure 12**. The Post-Development scenario introduces 142 residential dwellings, new driveway and roadway areas, three (3) rear-lot bioswales with infiltration capacity and three (3) StormTech infiltration chambers.

5.3.1 POST-DEVELOPMENT CATCHMENTS

Under post-development conditions, the Site is divided into 14 on-site catchments and three (3) off-site catchments. Sub-catchment delineations from Pre-Development conditions were maintained for the Post-Development analysis.

Under Post-Development conditions, the drainage ditch that is present under pre-development conditions is maintained through the wooded area. In addition, a new meandering drainage channel is introduced that drains off-site to the southeast.

Runoff from within Catchments 202f, 204b and 204d drain to rear lot bioswales via overland flow.

Runoff from the developed areas of the Site drains to one of the three (3) StormTech infiltration chambers (located in Catchment 203/205 and 209) via the on-site storm sewer system or directly to the on-site channel via overland flow and the on-site storm sewer system. Overflow from the StormTech infiltration chambers is released through a series of headwalls throughout the Site. Overflow is only expected to occur occasionally during intense storm events that exceed the capacity of each system. Runoff discharged through the headwalls drains to the on-site channel which flows off-site in the southeast corner. The outlets for each Catchment are summarized below:

On-Site Catchments:

Post-Development On-Site Catchment 201a: Drains to a series of rear lot catch basins (RLCB) via overland flow that connect to the on-site sewer system in Catchment 201b. Runoff collected in the storm sewer is directed to a storage pipe underneath the roadway in Catchment 201-b for quantity control (i.e. no infiltration), and is subsequently released to an oil-grit separator (OGS) and sand filter plunge pool that connects to the existing ditch in Catchment 205 and on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road**.**

Post-Development On-Site Catchment 201b: Drains to series of catch basins and manholes located in the roadway of Catchment 201b. Runoff collected in the storm sewer is directed to a storage pipe underneath the roadway in Catchment 201-b for quantity control (i.e. no infiltration), and is subsequently released to an oil-grit separator (OGS) and sand filter plunge pool that connects to the existing ditch in Catchment 205 and on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 202a: Drains to a series of catch basins and manholes located in the roadway of Catchment 202a. Runoff collected in the storm sewer is directed to a StormTech infiltration chamber (StormTech 7) located in sub-catchment 209-632 and 209-695 for infiltration. Overflow is released through a headwall that drains to the on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 202b: Drains to a StormTech infiltration chamber (StormTech 7) via overland flow. The StormTech infiltration chamber is located in sub-catchment 209-632 and 209-695 for infiltration. Any overflow is released through a headwall that drains to the on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 202f: Drains to the on-site storm sewers in Catchment 202a via direct connection, rear yard bio-swale or overland flow. The rear yard bio-swales will provide an opportunity for runoff from small to medium precipitation events to infiltrate where excess runoff from larger events will be directed to the storm sewer. Runoff collected in the storm sewer is directed to a StormTech infiltration chamber

(StormTech 7) located in sub-catchment 209-632 and 209-695 for infiltration. Any overflow is released through a headwall that drains to the on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 203: Drains to the on-site storm sewers via direct connection and overland flow. Runoff collected in the storm sewer is directed to a StormTech infiltration chamber (StormTech 3) underneath sub-catchment 203-628 and 205-627 for infiltration. Overflow is released through a headwall that drains to the on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 204a: Drains to the on-site storm sewers via direct connection or overland flow. Runoff collected in the storm sewer is directed to a StormTech infiltration chamber underneath sub-catchment 209-631 for infiltration (StormTech 4). Overflow is released through a headwall that drains to the on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 204b: Drains to the on-site storm sewers via RLCBs or direct connection. Runoff collected in the storm sewer is directed to a StormTech infiltration chamber underneath sub-catchment 209-631 for infiltration (StormTech 4). Overflow is released through a headwall that drains to the on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 204c: Drains to the rear yard bio-swale via overland flow for infiltration. Runoff from the bioswale are directed to a StormTech infiltration chamber underneath sub-catchment 209-631 for infiltration (StormTech 4). Overflow is released through a headwall that drains to the on-site channel. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 205a: Drains to the on-site channel via overland flow through the rear yard swale. The channel connects to the existing wetland adjacent to the southern property boundary, then discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development On-Site Catchment 205: Drains to the on-site channel that connects to the existing wetland adjacent to the southern property boundary (in Catchment 209) and discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road**.**

Post-Development On-Site Catchment 206a: Drains to rear yard swales in Catchment 205a.

Post-Development On-Site Catchment 206b: Drains to a series of RLCBs at the east side of Catchment 204b that connect to the storm sewer. Refer to Catchment 204b (above) for further drainage information.

Post-Development On-Site Catchment 207: Drains to a series of RLCBs at the east side of Catchment 204b that connect to the storm sewer. Refer to Catchment 204b (above) for further drainage information.

Post-Development On-Site Catchment 209: Drains to the on-site channel that connects to the existing wetland. Runoff discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Off-Site Catchment(s):

Post-Development Off-Site Catchment 208: Drains to the rear yard lawns in Catchment 201a and 201b. To simplify calculations, this drainage has been handled through Catchment 201a.

Post-Development Off-Site Catchment 211: Drains to the on-site channel in Catchment 205, which connects to the existing wetland. Runoff discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Post-Development Off-Site Catchment 214: Drains to the on-site channel in Catchment 209, which connects to the existing wetland. Runoff discharges off-site through the southern property boundary via a culvert underneath Lakeshore Road.

Runoff from the developed areas in on-site catchment areas will be affected by the creation of buildings and driveway areas.

5.3.2 POST-DEVELOPMENT ANALYSIS

Properties associated with area, slope, soil type, and land cover were analyzed and assigned to each Post-Development sub-catchment. The values assigned to each Post-Development sub-catchment are provided in Table J-1 (**Appendix J**). These values were used to estimate an Infiltration Factor. The Infiltration Factors were reviewed to confirm that they are appropriate and adjusted if necessary.

Table J-1 includes the overall analysis of the total Study Area's infiltration and runoff. Table J-1 also documents the calculation of volumes associated with input and output parameters for the Post-Development condition. These volumes are also expressed in terms of the number of mm of water within each sub-catchment area. The volumes are summed by catchment and for the total property area.

Assumptions incorporated into the water budget for the Post-Development scenario included:

1) Impervious surfaces (roads, driveways and buildings) are assumed to have a 10% evaporative loss.
2) Runoff is assumed to be conveyed directly to the outlets and not infiltrated.
3) Runoff from external sub-catchments is released to the closest on-site sub-catchment, unless otherwise stated.
4) Rooftop and rear lawn area runoff in Catchments 202f, 204b and 204d will be captured by rear lot bioswales, with 80% of the volume received by the bioswales assumed to infiltrate as per direction from SKA. Refer to Appendix C of the Functional Servicing and Stormwater Management Report (FSSR) prepared by SKA in April 2021 for further details.
5) The remaining run off from the developed areas in Catchments 202a, 202b, 202f, 203, 204a, 204b, 204c and 204d are captured by one of the three (3) StormTech infiltration chambers (located in Catchments 203 and 209), with 80% of the volume received by the infiltration chambers assumed to infiltrate as per direction from SKA. Refer to Appendix C of the FSSR prepared by SKA in April 2021 for further details.
6) To be conservative, no infiltration is assumed through the sand filter as one (1) meter separation between the base do the facility and the seasonally high groundwater table cannot be achieved.

A summary of the Post-Development water budget calculations is provided in **Table 5**.

5.3.3 POST-DEVELOPMENT INFILTRATION

In the post-development condition, the Site will contain approximately 65,872 m^2 of impervious surfaces (24% impervious). This would result in a total infiltration of 76,100 m^3/year or 283 mm/yr. Of the total infiltration, 46,804 m^3/yr infiltrates directly through pervious areas and 29,296 m^3/yr is runoff that infiltrates through the rear lot bioswales and the three (3) StormTech infiltration chambers. The net infiltration would reflect approximately 33% of the precipitation (857.7 mm/yr).

5.3.4 POST-DEVELOPMENT RUNOFF

The introduction of impervious surfaces will increase the total runoff from the developed area. The total runoff generated by the proposed development area is 65,589 m^3/yr or 243.7 mm/year, however, the on-site bioswales and infiltration chambers will receive and infiltrate approximately 29,296 m^3/yr of this runoff which leads to a net runoff generation of 36,293 m^3/yr or 134.8 mm/yr. The total calculated Post-Development runoff represents approximately 15.7% of the annual precipitation (857.7 mm/yr).

5.3.5 COMPARISON WITH PRE-DEVELOPMENT

Table 5 provides a comparison of the water budget estimates for the Pre-Development and Post-Development cases with mitigation measures included. The total on-site infiltration is estimated to increase by approximately 25% or

15,063 m^3/yr. The introduction of additional impervious surfaces, with mitigation measures in place, is estimated to increase total runoff by 75.6% or 15,623 m^3/yr.

The estimated runoff to the southeast is predicted to increase by 49% or 9,909 m^3/yr while the runoff that previously exited the Site in the southwest corner is reduced to 0 m^3/yr. By incorporating the three (3) StormTech infiltration chambers and rear lot bio-swales, approximately 45% of the runoff generated by the development will potentially be infiltrated.

Runoff and infiltration are maintained in the external catchments as the land use changes for this Site occur on-site. Changes to runoff and infiltration will occur primarily on-site where residence and driveway are constructed and where site re-grading will occur.

The primary objective of the water balance mitigation analysis is to determine whether the annual infiltration to groundwater beneath the development area can be maintained. Given that an infiltration surplus of 15,063 m^3/yr exists under post-development conditions, no additional mitigation measures are required.

5.4 WATER QUALITY

The water budget analysis must also consider potential changes to water quality that could be experienced in relation to the proposed development. The following sections describe the typical contaminants associated with the current and future land uses.

5.4.1 EXISTING CONDITIONS

The Site is currently vacant. As such, there are no activities present that could potentially impact groundwater quality at this time.

5.4.2 FUTURE CONDITIONS

The proposed Post-Development condition includes new driveway and roadway areas. These areas may be a future source of contamination to groundwater infiltration or surface water runoff by winter road de-icing agents. The most effective method of reducing potential impacts from salt or other winter road de-icing agents is to minimize the mass/volume of material applied through the use of Best Management Practices (BMPs). Any pervious areas used for winter snow storage may also become potential sources of contamination from winter road de-icing agents. BMPs recommend storing snow on impervious surfaces.

The driveway and roadway areas may also be a potential sources of petroleum hydrocarbons. These are typically contained in vehicles. The release of these substances will typically be the result of accidents. These potential releases could result in impairment of water quality by infiltrating into the groundwater. The risk of an accident occurring at the Site is low considering the only traffic will be the residents who occupy the building.

In pervious areas, soil-enrichment agents (i.e. fertilizers) and/or herbicides may also be a source of contamination. Application of these products should be minimized in order to reduce potential contamination.

6 POLICY AREAS

6.1 WELLHEAD PROTECTION AREAS

The Regional Municipality of York Official Plan (YROP) delineates Wellhead Protection Areas (WHPA) for protection of the groundwater supplies that are used to provide the primary source of potable drinking water to the communities of Aurora, Newmarket, and Ballantrae. In addition to the YROP, a Provincial initiative on Drinking Water Source Protection under *The Clean Water Act*, 2006 has been underway since 2006 to develop Drinking Water Source Protection Plans. The WHPA and vulnerability scores from the Assessment Report for the Lakes Simcoe and Couchiching Source Protection Area are provided as **Figure 13**.

The Site does not lie within delineated WHPA for municipal water supply wells in Aurora or Ballantrae.

Figure 14 illustrates that the entire Site lies within an area designated as WHPA-Q. Policies in the Lakes Simcoe and Couchiching Source Protection Plan for WHPA-Q require that recharge be maintained or enhanced. The water balance calculations presented above demonstrate that the development as proposed, with the stormwater management design as prepared by SKA (2021) will enhance the pre-development infiltration and hence, comply with these policies.

6.2 SIGNIFICANT GROUNDWATER RECHARGE AREAS

Policies 6.36 DP through 6.40 DP of the Lake Simcoe Protection Plan address Significant Groundwater Recharge Areas (SGRA).

The Assessment Report for the Lakes Simcoe and Couchiching Source Protection Area contains mapping of Significant Groundwater Recharge Areas (SGRA). SGRA are regional areas that receive more than the average estimated recharge for a watershed area.

The majority of the Site is not within a mapped SGRA as shown on **Figure 14**. A small portion of the southeast corner of the site that has already been developed is shown to have high sensitivity.

The proposed development design provides for a very minor increase in net off-site run-off and enhancement of on-site recharge. This is not anticipated to negatively impact the features protected by the SGRA or ESGRA policy areas.

6.3 HIGHLY VULNERABLE AQUIFERS

The *Clean Water Act*, 2006, via the Source Protection Plans, and the Oak Ridges Moraine Conservation Plan contain policies that apply to Highly Vulnerable Aquifers. **Figure 15** presents the mapping of Highly Vulnerable Aquifers (HVA) from the Assessment Report for the Lakes Simcoe and Couchiching Source Protection Area. HVA are considered susceptible to contamination of groundwater from activities on the surface or shallow subsurface. The majority of the central and east part of the Site is mapped as a Highly Vulnerable Aquifer. The proposed land use as residential is expected to have minimal potential to affect underlying groundwater resources.

Figure 16 presents the mapping for highly vulnerable aquifers as protected by policies under the Oak Ridges Moraine Conservation Plan. The Site is mapped within an area of Highly Aquifer Vulnerability.

7 DEWATERING ASSESSMENT

The potential requirements for dewatering in association with construction of the proposed residences and associated buried utilities (storm and sanitary sewers), and for potential long-term drainage from foundation drains is assessed below. The potential requirements for permitting associated with dewatering activities are as follows:

Takings of less than 50,000 L/day at any one time do not require a permit;

Takings of greater than 50,000 L/day but less than 400,000 L/day at any one time requires registration with the Environmental Activity and Sector Registry (EASR); or

Takings of greater than 400,000 L/day at any one time for the project will require a Category 3 Permit to Take Water (PTTW).

WSP has prepared a preliminary assessment of the dewatering requirements and the associated impacts associated with construction and long-term drainage.

7.1 DEWATERING EQUATIONS

Given the subsurface conditions encountered in the study area, equations are used to account for excavations under unconfined groundwater conditions. For the purposes of these calculations, long narrow trench equations are assumed to be more appropriate to estimate flows for the foundation excavation, since the length to width ratio of the excavation is greater than 1.5.

LONG NARROW TRENCH EQUATION – UNCONFINED CONDITIONS

Dewatering volumes were estimated using the following equation from Powers (1992) for drainage trench of finite length with a length to width ratio of greater than 1.5 for an unconfined system:

$$Q = \frac{xK(H^2 - h^2)}{In\frac{R_o}{r_s}} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

where Q is discharge (m^3/s), x is the trench sidewall length (m), K is hydraulic conductivity (m/s), H is initial water level (m), h is the required drawdown (m), R_0 is the equivalent radius of influence (m), and r_s is the equivalent well radius (m). For more details, please refer to Powers (1992). Using the equation for a long, narrow system provides a more conservative estimate for dewatering rates when compared with using the equation for a drainage trench from a line source.

DARCY'S LAW

Dewatering volumes for the calculation of seepage across the base of the excavation was estimated using the empirical Darcy's Law equation as described in Powers (1992):

$$Q = K_V A i$$

where Q is discharge (m^3/s), K_V is vertical hydraulic conductivity (m/s), A is cross-sectional area (m^2), and i is the hydraulic gradient.

EQUIVALENT RADIUS OF INFLUENCE (R_O)

The equivalent radius of influence R_0 is assumed to be equivalent to the zone of influence (ZOI). R_0 was estimated using the empirical Sichart equation as described in Powers (1992):

$$R_0 = 3000(H - h)\sqrt{K}$$

where R_0 is the equivalent radius of influence or ZOI (meters), H is the initial water level (meters), h is the required drawdown (meters), and K is hydraulic conductivity (meters/second).

7.2 ASSUMPTIONS

Assumptions were incorporated into the dewatering volume assessments based on the site-specific data collected in site investigations and information about the proposed development. The assumptions related to construction dewatering are as follows:

No measures are to be put in place to restrict flows into the excavations (e.g., sheet piling, caissons) to provide more conservative (overestimate) dewatering rates;

The aquifer is uniform, continuous and of infinite extent;

The proposed elevations of the building footings, storm and sanitary sewer inverts and StormTech infiltration chamber inverts were provided by SKA in the Preliminary Grading, Proposed Storm Servicing and Proposed Sanitary Servicing plans dated March 2021, and are presented in **Appendix A**;

The proposed dimensions of the StormTech infiltration chambers were provided by SKA in the table titled "13:286, Ballantrae Lands, LID Sizing" and is presented in **Appendix A**;

The dimensions for each building type used to estimate potential dewatering requirements are outlined below:

- Building Type A – 20.2 x 13.2 m
- Building Type B – 21.5 x 13.2 m
- Building Type C – 23.6 x 13.2 m

Based on input from SKA, proposed footing elevations shown in the Preliminary Grading plan are assumed to apply to approximately 4 lots;

Single well response tests conducted at the six on-site monitoring wells estimated hydraulic conductivities ranging from 1.47 $x10^{-5}$ m/sec to 1.17 $x10^{-4}$ m/sec, with a geometric mean of 3.58 $x10^{-5}$ m/sec. Conservative dewatering rates for the installation of storm and sanitary sewers were estimated using the geometric mean of 3.58 $x10^{-5}$ m/sec.

For the purposes of estimating flux across the base of the excavation, vertical hydraulic conductivity was used in the calculation using the Darcy equation. The vertical hydraulic conductivity is assumed to be an order of magnitude lower than the horizontal hydraulic conductivity (3.88 x 10^{-6} m/sec for the conservative dewatering rate);

The vertical hydraulic gradient was assumed to be 0.1 m/m;

Dewatering during construction is assumed to lower the water table by 0.5 m below the base of the building footing and 1.0 m below the base of the sewer and StormTech infiltration chamber inverts.

Assumed seasonal high groundwater elevations for the Site are based on elevations measured in April 2017 (Table E-1 of **Appendix E**).

Groundwater elevation contours were used to prepare **Figure 17** to illustrate relative elevations of building foundations to the seasonally high groundwater elevations for use in the dewatering assessment.

Groundwater elevation contours were used to prepare **Figure 18 and Figure 19** to illustrate relative elevations of proposed sanitary and storm sewers and StormTech infiltration chambers to the seasonally high groundwater elevations for use in the dewatering estimates.

For the purposes of the estimating potential dewatering requirements during the construction of the StormTech chambers, the average observed seasonally high groundwater elevations was compared to the bottom elevation of the proposed granular base.

Excavations for storm and sanitary sewers are assumed to be segments no longer than 50 m.

Precipitation entering the open excavations were estimated assuming a 10 mm precipitation event.

A safety factor of 50% is applied to the construction dewatering estimates to account for fluctuations in groundwater elevations and variations in soil conditions.

Figure 20 and Figure 21 have been prepared to illustrate the relative elevations of the proposed base of footings and base of Stormtech chambers and the seasonal high water table in cross-section. The cross-section locations are illustrated on **Figure 17.** The groundwater elevations observed during April 2017 are also shown on **Figure 20 and Figure 21** to illustrate that average groundwater elevations are at least 1.0 m below the proposed base of footings and base of Stormtech chambers.

The primary factors that will control the rate of seepage into the excavation or foundations are the hydraulic conductivity and the depth that the water table will be lowered.

This assessment does not represent an engineering design of a dewatering operation, but a preliminary hydrogeological analysis for assessment of dewatering volumes. The actual design of the dewatering operation will be the responsibility of the contractor.

7.3 DEWATERING CALCULATIONS

7.3.1 CONSTRUCTION DEWATERING FOR RESIDENTIAL BUILDING FOUNDATIONS

The proposed elevations of the underside of the building footings were compared to the observed seasonally high groundwater elevations to determine if dewatering is required to maintain dry conditions during the construction of each building lot foundation. A detailed summary of this analysis is provided in **Table 6** and shown on **Figure 17.**

Based on the assessment, it is anticipated that groundwater entering the excavation areas will be limited and dewatering requirements will be minimal, if any. It is recommended that appropriate measures are implemented in the event of potential precipitation events during construction, to keep excavation areas dry and stable. Registration on the EASR is not required unless daily water takings are required to be more than 50,000 L. This registration can be obtained quickly if required.

The following is a summary of the dewatering analysis for each building foundation with footings depths above the water table:

Building Type A (approximate building dimensions of 20.2 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 1.0 and 2.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 2,666 L/day to each building excavation during a rain event. There are five (5) lots under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type A (approximate building dimensions of 20.2 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 2.0 and 3.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 2,666 L/day to each building excavation during a rain event. There is one (1) lot under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type B (approximate building dimensions of 21.5 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 0 and 1.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 2,838 L/day to each building excavation during a rain event. There are two (2) lots under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type B (approximate building dimensions of 21.5 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 1.0 and 2.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 2,838 L/day to each building excavation during a rain event. There are 13 lots under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type B (approximate building dimensions of 21.5 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 2.0 and 3.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 2,838 L/day to each building excavation during a rain event. There are seven (7) lots under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 1.0 and 2.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 3,115 L/day to each building excavation during a rain event. There are 21 lots under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 2.0 and 3.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 3,115 L/day to each building excavation during a rain event. There are 26 lots under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 3.0 and 4.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 3,115 L/day to each building excavation during a rain event. There are 37 lots under this category. These building foundations could potentially be constructed without registration on the EASR.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths plus 0.5 m construction drawdown between 4.0 and 5.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed building foundation footing elevations indicates that the footings will be above the water table. Precipitation can potentially contribute up to 3,115 L/day to each building excavation during a rain event. There are 30 lots under this category. These building foundations could potentially be constructed without registration on the EASR.

This assessment does not represent an engineering design of a dewatering operation, but provides a preliminary hydrogeological analysis for assessment of dewatering volumes. The actual design of the dewatering operation will be the responsibility of the contractors.

7.3.2 LONG-TERM DRAINAGE

Based on the observed water table elevations in April 2017, the majority of the proposed building footings are above the seasonally high groundwater conditions by at least 1.0 m. Two (2) lots along the south west corner of the Site have proposed building footings 0.7 m above the seasonally high groundwater elevations.

Based on the assessment, it is anticipated that groundwater entering the foundation drains for each building lot will be minimal, if any. A detailed summary of this analysis is provided in **Table 7.**

The following is a summary of the long-term drainage analysis for each building foundation with footings depths above the water table:

Building Type A (approximate building dimensions of 20.2 m by 13.2 m) with proposed footing depths between 1.0 and 2.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type A (approximate building dimensions of 20.2 m by 13.2 m) with proposed footing depths between 2.0 and 3.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type B (approximate building dimensions of 21.5 m by 13.2 m) with proposed footing depths between 0 and 1.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type B (approximate building dimensions of 21.5 m by 13.2 m) with proposed footing depths between 1.0 and 2.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type B (approximate building dimensions of 21.5 m by 13.2 m) with proposed footing depth between 2.0 and 3.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths between 1.0 and 2.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths between 2.0 and 3.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths between 3.0 and 4.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

Building Type C (approximate building dimensions of 23.6 m by 13.2 m) with proposed footing depths between 4.0 and 5.0 m above the observed seasonally high water table: Seepage into the foundation for an individual home is not anticipated.

7.3.3 CONSTRUCTION DEWATERING FOR INSTALLATION OF UTILITIES

The calculations of the estimated volumes of water that could enter the excavations during the installation of storm and sanitary sewers are shown in **Table 8**. These calculations show the conservative estimate of the dewatering rate that may be observed per trench segment, ranging in lengths between 14 and 50 m. Dewatering calculations are provided in **Appendix K**.

The following is a summary of the dewatering estimates for utility installations with similar maximum excavation depths below the water table:

Sanitary sewer (200 mm dia.) trench with proposed pipe invert depths plus 1.0m construction drawdown between 0 and 1.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls of a single 50 m trench excavation is estimated to be up to 8,939 L/day, with an estimated zone of influence (ZOI) of up to 18 m. It was estimated that precipitation may contribute up to 600 L/day, in addition to the estimated volumes listed above. There are approximately eight (8) trench segments in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Sanitary sewer (200 mm dia.) trench with proposed pipe invert depths plus 1.0m construction drawdown between 1.0 and 2.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls of a single 50 m trench excavation is estimated to be up to 26,254 L/day, with an estimated zone of influence (ZOI) of up to 36 m. It was estimated that precipitation may contribute up to 600 L/day, in addition to the estimated volumes listed above. There are approximately ten (10) trench segments in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Sanitary sewer (200 mm dia.) trench with proposed pipe invert depths plus 1.0m construction drawdown between 2.0 and 3.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls of a single 50 m trench excavation is estimated to be up to 50,661 L/day, with an estimated zone of influence (ZOI) of up to 54 m. It was estimated that precipitation may contribute up to 600 L/day, in addition to the estimated volumes listed above. There are approximately three (3) trench segments in this category. Registration is recommended based on the potential that the construction dewatering rate for these installations could be between 50,000 L and 400,000 L/day.

Sanitary sewer (200 mm dia.) trench with proposed pipe invert depths plus 1.0m construction drawdown greater than 3.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls of a single 25 m trench excavation is estimated to be up to 30,015 L/day, with an estimated zone of influence (ZOI) of up to 54 m. It was estimated that precipitation may contribute up to 300 L/day, in addition to the estimated volumes listed above. There is one (1) trench segment in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm box sewer (1800 by 900 mm.) trench with proposed pipe invert depths plus 1.0m construction drawdown between 0 and 1.0 m observed seasonally high below the water table: The dewatering volumes entering across the walls a single 50 m trench excavation is estimated to be up to 11,167 L/day, with an estimated zone of influence (ZOI) of up to 18 m. It was estimated that precipitation may contribute up to 1400 L/day, in addition to the estimated volumes listed above. There are approximately two (2) trench segments in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm sewer (300mm) trench with proposed pipe invert depths plus 1.0m construction drawdown between 0 and 1.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 50 m trench excavation is estimated to be up to 9,118 L/day, with an estimated zone of influence (ZOI) of up to 18 m. It was estimated that precipitation may contribute up to 650 L/day, in addition to the estimated volumes listed above. There is approximately one (1) trench segment in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm sewer (375mm) trench with proposed pipe invert depths plus 1.0m construction drawdown between 0 and 1.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 38 m trench excavation is estimated to be up to 8,658 L/day, with an estimated zone of influence (ZOI) of up to 18 m. It was estimated that precipitation may contribute up to 527 L/day, in addition to the estimated volumes listed above. There is approximately one (1) trench segment in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm sewer (525mm) trench with proposed pipe invert depths plus 1.0m construction drawdown between 0 and 1.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 44 m trench excavation is estimated to be up to 9,201 L/day, with an estimated zone of influence (ZOI) of up to 18 m. It was estimated that precipitation may contribute up to 674 L/day, in addition to the estimated volumes listed above. There is approximately one (1) trench segment in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm sewer (825mm) trench with proposed pipe invert depths plus 1.0m construction drawdown between 0 and 1.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 50 m trench excavation is estimated to be up to 9,945 L/day, with an estimated zone of influence (ZOI) of up to 18 m. It was estimated that precipitation may contribute up to 913 L/day, in addition to the estimated volumes listed above. There is approximately one (1) trench segment in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm box sewer (1800 by 900 mm.) trench with proposed pipe invert depths plus 1.0m construction drawdown between 1.0 and 2.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 50 m trench excavation is estimated to be up to 31,468 L/day, with an estimated zone of influence (ZOI) of up to 36 m. It was estimated that precipitation may contribute up to

1,400 L/day, in addition to the estimated volumes listed above. There are approximately three (3) trench segments in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm sewer (450mm) trench with proposed pipe invert depths plus 1.0m construction drawdown between 1.0 and 2.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 50 m trench excavation is estimated to be up to 27,284 L/day, with an estimated zone of influence (ZOI) of up to 36 m. It was estimated that precipitation may contribute up to 725 L/day, in addition to the estimated volumes listed above. There is approximately one (1) trench segment in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm sewer (600mm) trench with proposed pipe invert depths plus 1.0m construction drawdown between 1.0 and 2.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 50 m trench excavation is estimated to be up to 27,849 L/day, with an estimated zone of influence (ZOI) of up to 36 m. It was estimated that precipitation may contribute up to 800 L/day, in addition to the estimated volumes listed above. There is approximately two (2)) trench segments in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Storm sewer (825mm) trench with proposed pipe invert depths plus 1.0m construction drawdown between 1.0 and 2.0 m below the observed seasonally high water table: The dewatering volumes entering across the walls a single 50 m trench excavation is estimated to be up to 28,634 L/day, with an estimated zone of influence (ZOI) of up to 36 m. It was estimated that precipitation may contribute up to 913 L/day, in addition to the estimated volumes listed above. There is approximately one (1) trench segment in this category. Individual trench segments within this category of sewers could be excavated and dewatered without registering on the EASR.

Based on the assessment, it is anticipated that groundwater entering each trench segment, ranging in lengths between 14 and 50 m, will range between 0 L/day and 50,661 L/day. Registration on the EASR is recommended based on the potential that the construction dewatering rate for these installations could be between 50,000 L and 400,000 L/day.

The dewatering estimates provided herein address potential dewatering requirements associated with construction of the proposed utilities, and is intended to be conservative to reflect the maximum volume that could be experienced. These calculations only reflect dewatering requirements for construction of storm and sanitary sewers in up to 50m trench segments.

The utilities are to be constructed with low-permeability seals within the backfill below the seasonally high water table to minimize the potential for drainage of water or potential movement of contaminants within the excavated trenches.

This assessment does not represent an engineering design of a dewatering operation, but provides a preliminary hydrogeological analysis for assessment of dewatering volumes. The actual design of the dewatering operation will be the responsibility of the contractors.

7.3.4 CONSTRUCTION DEWATERING FOR INSTALLATION OF STORMTECH INFILTRATION CHAMBERS

Based on the observed water table elevations in April 2017, the granular base of the proposed StormTech infiltration chambers are all above the seasonally high groundwater conditions by at least 1.0 m. A detailed summary of this analysis is provided in **Table 9** and shown on **Figure 19.**

Based on the assessment, it is anticipated that groundwater entering the excavation areas will be limited and dewatering requirements will be minimal, if any. It is recommended that appropriate measures are implemented in the event of potential precipitation events during construction, to keep excavation areas dry and stable. Registration on the EASR is not required, unless daily water takings are required to be more than 50,000 L. This registration can be obtained quickly if required.

The following is a summary of the dewatering analysis for StormTech infiltration chamber installations with maximum excavation depths above the seasonally high water table:

StormTech LID 3 (dimensions of 18 m by 30 m) excavation with proposed granular invert depths plus 1.0 m construction drawdown between 1.0 and 2.0 above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed granular invert elevations indicates that the base of the StormTech infiltration chamber will be above the water table. It was estimated that precipitation may contribute up to 5,400 L/day to the excavation and will require removal. This structure could potentially be constructed without registration on the EASR.

StormTech LID 4 (dimensions of 97 m by 20 m) excavation with proposed granular invert depths plus 1.0m construction drawdown between 0 and 1.0 m above the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed granular invert elevations indicates that the base of the StormTech infiltration chamber will be above the water table. It was estimated that precipitation may contribute up to 19,400 L/day to the excavation, and will require removal. This structure could potentially be constructed without registration on the EASR.

StormTech LID 7 (dimensions of 50 m by 39 m) excavation with proposed granular invert depths plus 1.0m construction drawdown between 0 and 1.0 m below the observed seasonally high water table: A comparison of the average groundwater elevation and the proposed granular invert elevations indicates that the base of the StormTech infiltration chamber will be above the water table. It was estimated that precipitation may contribute up to 19,500 L/day to the excavation, and will require removal. This structure could potentially be constructed without registration on the EASR.

This assessment does not represent an engineering design of a dewatering operation but provides a preliminary hydrogeological analysis for assessment of dewatering volumes. The actual design of the dewatering operation will be the responsibility of the contractors.

7.4 DEWATERING SUMMARY

The dewatering analysis to support the proposed construction of building foundations and long-term drainage of the proposed residences are summarized in **Table 6** and **Table 7.** The potential volumes of water that may require removal during construction of the proposed storm and sanitary sewers and the proposed StormTech infiltration trenches are summarized in **Table 8** and **Table 9**.

There is potential that the volumes of water to be removed during construction dewatering of the entire Site may be greater than 50,000 L/day but can likely be managed to be less than 400,000 L/day. The proposed construction at the site is recommended to be registered as an activity on the EASR. Management may be required to coordinate construction activities such that daily dewatering volumes removed are maintained at less than 400,000 L/day. Records to demonstrate that daily volumes are less than 400,000 L/day for the Site will be a requirement of registration.

WSP notes that the water table is observed to vary by approximately 1.0 to 2.0 m during the course of the year, with higher values in the winter and spring and lower values in the summer and fall. Minimal dewatering during construction of the proposed building foundations and the proposed StormTech infiltration chambers will be limited, if any. Construction dewatering calculations estimate that the total volumes generated during construction for the installation of storm and sanitary sewers trench segments ranges between 31,468 L/day and 50,661 L/day, with lengths between 14 m and 50 m. While it is reasonable that these values may only be encountered during the winter and spring months, WSP recommends being prepared to manage volumes of this magnitude during construction in any season.

Review of the water level data suggests that the foundations for the majority of proposed foundation structures will be above the seasonally low water table by at least 1.0 m, with two lots along the south west corner of the Site having proposed building footings 0.7 m above the seasonally high groundwater elevations. Foundation drainage would not occur year round and may only occur in response to precipitation events.

Groundwater samples collected from the on-site monitoring wells indicated that all concentrations of the parameters tested are less than the MECP Table 2 SCS values. To support the registration of dewatering activities associated with the installation of storm and sanitary sewers in the EASR, additional water quality sampling is recommended to determine acceptable discharge options during construction dewatering. Groundwater samples will need to be collected and analyzed for Provincial Water Quality Objectives parameters, to determine whether discharge of groundwater to the natural environment is appropriate.

8 CONCLUSIONS

1 WSP Canada Inc. (WSP) was retained by Far Sight Homes to prepare a Hydrogeological Assessment and Water Balance Study for the proposed residential development located at 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario (Site).

2 The proposed development area lies within the Oak Ridges Moraine physiographic region as defined by Chapman and Putnam (1984). The Oak Ridges Moraine is typically characterized by sand or gravel hills with level tracts of sand between them. The area in and surrounding the Site consists of Kame moraines.

3 The Site currently contains a wetland along the southern property boundary adjacent to the manmade pond. The wetland is fed by run-off from the Site and discharges off-site to through the southern property boundary via a culvert underneath Lakeshore Road.

4 Based on the stratigraphy observed during the borehole drilling and test pit excavations at the Site and well records from the Ministry of the Environment, Conservation and Parks (MECP) Water Well Information System, the Site is predominantly underlain by alternating layers of sand and silt with isolated layers of fill, silty sand/sandy silt and clayey silt observed in certain boreholes.

5 Groundwater elevations measured as part of the bi-monthly monitoring program in April 2017 show the local groundwater flow direction is to the southeast across the Site. The observed groundwater flow directions are interpreted to reflect the local influence of the surface water drainage that ultimately flows into the regional drainage system that drains to Lake Simcoe to the North. Groundwater levels at the Site fluctuated from a seasonal high of 0.2 m bgs (April 2017) to a seasonal low of 4.57 m bgs (October 2016). The seasonal high was observed at OW16-1 which is located in the area of the proposed realigned drainage channel.

6 The infiltration test conducted in the vicinity of the proposed stormwater management locations showed field saturated hydraulic conductivity values consistent with the observed soils. These soils are considered to be capable of supporting a design infiltration rates between 40 mm/hour and 51 mm/hour in the sand and gravel, and between 16 mm/hour and 23 mm/hour in the silty clay, with a safety factor of 2.5.

7 In-situ hydraulic conductivity testing was conducted at all six (6) monitoring wells on June 30, 2016. The results of these test indicate that the hydraulic conductivity of the soil at the Site range from 1.47 $x10^{-5}$ m/sec to 1.17 $x10^{-4}$ m/sec. These results are consistent with the observed soil descriptions of medium to fine sand in which the monitoring wells are screened.

8 Representative samples of groundwater were collected from six (6) monitoring wells on June 30, 2016. The results of the test indicated that parameter concentrations are less than MECP Table 2: Full Depth Generic Site Condition Standards (SCS) in a Potable Ground Water Condition for All Types of Property Use (Coarse Textured Soil).

9 The Climate-Based Water Budget indicates that average annual precipitation over the past 30 years is 857.7 mm/year. The available moisture surplus at the Site ranges between 283.9 mm/yr and 301.9 mm/yr depending on the type of soil and vegetation cover. The moisture surplus will reflect the infiltration and runoff based on the soil properties, slopes, and vegetation within individual catchments.

10 Under existing conditions, there are two (2) on-site catchments and three (3) off-site catchment. Runoff generated on-site outlets at two (2) different locations.

11 Runoff from the majority of the Site is directed to the drainage ditch which connects to the existing wetland and discharges over the southern property boundary via a culvert underneath Lakeshore Road.

12 Runoff from a small portion of the site located in the southwest corner flows off-site to the south via overland flow.

13 The Pre-Development Water Budget reflects infiltration for the Site of approximately 61,037 m^3/yr and runoff from the Site of approximately 20,670 m^3/yr.

14 The Post-Development Water Budget reflects changes in land use to include increased areas of impervious surfaces (i.e. roads, buildings etc.) and re-grading. Under the proposed development conditions there are 14 on-site catchments and three (3) off-site catchment. Runoff from the developed areas of the Site are directed to rear lot bioswales and to three (3) different StormTech infiltration chambers while the remainder is conveyed to the drainage channels by the proposed storm sewers and/or overland flow. Runoff directed to the drainage channels flows to the existing wetland and is discharge off-site via the culvert underneath Lakeshore Road.

15 The Post-Development Water Budget predicts a total on-site infiltration of 76,100 m^3/yr. Of the total infiltration, 46,804 m^3/yr infiltrates through pervious areas and 29,296 m^3/yr infiltrates as a result of runoff from

developed areas being directed to the rear lot bioswales and on-site infiltration chambers. Overall, this is a increase of 25% relative to the Pre-Development case, and represents an infiltration surplus of 15,063 m^3/yr. At this time, additional mitigation measures are not required as there is an infiltration surplus.

16 The Post-Development Water Budget predicts a net runoff of 36,293 m^3/yr over the Site area. This is an increase of 75.6% or 15,623 m^3/yr relative to the Pre-Development case. The estimated runoff exiting the Site via the wetland and culvert is predicted to increase by 49% and the runoff directed off-site to the southwest will decrease by 100%.

17 The Site lies within an area designated as WHPA-Q. Policies in the Lakes Simcoe and Couchiching Source Protection Plan for WHPA-Q require that recharge be maintained or enhanced. The water balance calculations demonstrate that the development as proposed, with the stormwater management design as prepared by Sabourin Kimball & Associates Ltd. (2021) will enhance the pre-development infiltration and hence, complies with these policies.

18 The majority of the Site is not within a mapped SGRA. A small portion of the southeast corner of the site that has already been developed is shown to have high sensitivity. The proposed development design provides for a relatively minor increase in net off-site run-off and enhancement of on-site recharge. This is not anticipated to negatively impact the features protected by the SGRA or ESGRA policy areas.

19 The majority of the central and east part of the Site is mapped as a Highly Vulnerable Aquifer under the Assessment Report for the Lakes Simcoe and Couchiching Source Protection Area as well as the Oak Ridges Moraine Conservation Plan. The proposed land use as residential is expected to have minimal potential to affect underlying groundwater resources.

20 The foundations for the residential buildings are proposed to be above the seasonally high water table by at least 0.7m. Dewatering requirements during construction of the building foundations will be minimal, if any. The building foundations could potentially be constructed without registration on the EASR and foundation drainage would not occur year round and may only occur in response to precipitation events.

21 Some of the utilities proposed for the residential development will be below the seasonally high water table. Conservative estimates of the rate of dewatering during construction support that the project be registered on the EASR and that construction dewatering be managed by staging and seasonal planning to be less than 400,000 L/day. Actual dewatering rates experienced during construction may be substantially lower than the conservative estimates. The utilities are to be constructed with low-permeability seals within the backfill below the seasonally high water table to minimize the potential for drainage of water or potential movement of contaminants within the excavated trenches.

This concludes the Hydrogeological Assessment and Water Balance Study. We trust that this report satisfies your requirements. If you have any questions or concerns regarding this report, do not hesitate to contact our office.

9 REFERENCES

Chapman, L.J. and D.F. Putnam, 1984. The Physiography of Southern Ontario. Ontario Geological Survey, Third Edition. 270 pp. Accompanied by Map P.2715, Scale 1:600,000.

Gao, C., Shirota, J., Kelly, R.I., Brunton, F.R., and van Haaften, S., 2006. Bedrock Topography and overburden thickness mapping, southern Ontario, Ontario Geological Survey, Miscellaneous Release – Data 207.

Kassenaar, J.D.C. and Wexler, E.J., 2006. Groundwater Modelling of the Oak Ridges Moraine Area. CAMC-YPDT Technical Report #01-06.

Ontario Ministry of the Environment and Energy. 1995. Hydrological Technical Information Requirements for Land Development Applications.

Russell, H.A.J., Sharpe, D.R., and Logan, C. 2005: Structural Model of the Greater Toronto and Oak Ridges Moraine Areas, Southern Ontario: Halton Till; Geological Survey of Canada, Open File 5064, scale 1:250,000.

Russell, H.A.J., Sharpe, D.R., and Logan, C. 2005: Structural Model of the Greater Toronto and Oak Ridges Moraine Areas, Southern Ontario: ORM Sediment; Geological Survey of Canada, Open File 5065, scale 1:250,000.

Sabourin Kimble & Associates Ltd, 2021. Preliminary Grading Plans.

Sharpe, D.R., Russell, H.A.J., and Logan, C. 2005: Structural Model of the Greater Toronto and Oak Ridges Moraine Areas, Southern Ontario: Lower Sediment, Geological Survey of Canada, Open File 5067, scale 1:250,000.

Sharpe, D.R., Russell, H.A.J., and Logan, C. 2005. Structural Model of the Greater Toronto and Oak Ridges Moraine Areas, Southern Ontario: Newmarket Till, Geological Survey of Canada, Open File 5066, scale 1:250,000.

WSP Canada Inc., 2014. Shallow Subsurface Soil Investigations, Proposed Residential Development, 5452 Lakeshore Road, Community of Ballantrae, Project 141-15539-00.

WSP Canada Inc., 2016. Hydrogeological Assessment, 5452 Lakeshore Road, Whitchurch-Stouffville, Regional Municipality of York.

WSP Canada Inc., 2016. Updated Water Balance Assessment, 5452 Lakeshore Road, Whitchurch-Stouffville.

WSP Canada Inc., 2018. Geotechnical Investigation – Far Sight Homes, Ballantrae, 5426, 5452, 5584 Lakshore Road, Whitchurch-Stoufville, Ontario

WSP Canada Inc. 2018. Hydrogeological Assessment and Water Balance Study, 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario.

TABLES

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 Lakeshore Road, Ballantrae
Town of Whicthurch Stouffville, ON

Monitor Designation	Co-ordinates		Diameters		Depth	Elevations									
					Total	Top of Pipe	Ground	Bottom of Borehole	Bottom of Monitor	Screen		Sand Pack		Bentonite Seals	
	Northing	Easting	Borehole	Monitor						Bottom of	Top of	Bottom of	Top of	Bottom of	Top of
	m	m	mm	mm	m bgs	m ASL	m ASL	m ASL	m ASL	m ASL	m ASL	m ASL	m ASL	m ASL	m ASL
OW16-1	635722	4887799	210	51	6.10	329.82	328.88	322.78	322.78	322.78	325.83	322.78	326.48	326.48	328.88
OW16-2	635472	4887940	210	51	6.10	332.29	331.40	325.30	325.30	325.30	328.35	325.30	329.00	329.00	331.40
OW16-3			210	51	6.10	330.99	330.10	324.00	324.00	324.00	327.05	324.00	327.70	327.70	330.10
OW16-4			210	51	6.10	332.29	331.39	325.29	325.29	325.29	328.34	325.29	328.99	328.99	331.39
OW16-5	635563	4887612	210	51	5.20	335.10	334.14	328.04	328.94	328.94	331.99	328.94	332.64	332.64	334.14
OW16-6	635924	4888765	210	51	6.10	334.15	333.19	327.09	327.09	327.09	330.19	327.09	330.69	330.69	333.19

Notes:

1) "m agl" indicates metres above ground level.
2) "m bgs" indicates metres below ground surface
3) "m" indicates metres
4) "m ASL" indicates metres above sea level.

TABLE 2
INFILTRATION TESTS SUMMARY
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, ON

Test Number	Test Pit	Soil Type	Depth	Soil Factor	Stable Rate of Fall	Field Saturated Hydraulic Conductivity (K_fs)			Infiltration Rates	Factor of Safety	Infiltration Rates with Factor of Safety	Conservative Infiltration Rates by Unit	Conservative Infiltration Rates with Factor of Safety by Unit
					(cm/min)	(mm/day)	(m/s)	(m/day)	mm/h	Unitless	mm/h	mm/h	mm/h
1	TP16-1 (1m)	Sand, trace silt	1.0 - 1.3m (30 cm hole)	52.5	6.00	3150.00	3.6E-05	3.15	118	2.5	47.20	100	40.00
2	TP16-1 (2m)	Sand, trace silt	2.0 - 2.22 m (22 cm hole)	56.3	3.60	2026.80	2.3E-05	2.03	100	2.5	40.00		
3	TP16-2 (1m)	Gravely sand, trace silt	0.9 - 1.25 m (35 cm hole)	67.3	5.37	3612.95	4.2E-05	3.61	124	2.5	49.60		
4	TP16-2 (2m)	Sand, some silt	1.9 - 2.12 m (22 cm hole)	56.3	7.87	4431.61	5.1E-05	4.43	128	2.5	51.20		
5	TP16-3 (1m)	Silt, some clay, trace sand	1.0 - 1.30 m (30 cm hole)	30.5	0.20	61.00	7.1E-07	0.06	48	2.5	19.20	40	16.00
6	TP16-3 (2m)	Silt, trace clay and sand	2.0 - 2.3 m (30 cm hole)	30.5	0.60	183.00	2.1E-06	0.18	58	2.5	23.20		
7	TP16-4 (1m)	Clayey silt, trace sand	0.52 - 0.9 m (38 cm hole)	30.5	0.10	30.50	3.5E-07	0.03	40	2.5	16.00		
8	TP16-4 (2m)	Silt and clay, some sand	2.00 - 2.40 m (40 cm hole)	30.5	0.10	30.50	3.5E-07	0.03	40	2.5	16.00		
					Geometric Mean (m/s)		**1.18E-05**		**80**	**2.5**	**32.00**	**80**	**32.00**

NOTES:

1) Field observations and calculations summary provided in Tables D-1 through D-8.
2) "m bgs" = metres below ground surface
3) Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE 3
WATER QUALITY RESULTS
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, ON

Parameters Sample Date	UNIT	Table 2 SCS [1]	OW16-1 30-Jun-16	OW16-2 30-Jun-16	OW16-3 30-Jun-16	OW16-4 30-Jun-16	OW16-5 30-Jun-16	OW16-6 30-Jun-16
Water Quality Assessment								
Electrical Conductivity	uS/cm	-	780	570	750	490	470	1100
pH	pH Units	-	7.94	7.93	7.84	8.06	7.92	7.87
Saturation pH	-	-	7.02	7.11	6.81	7.18	7.01	6.80
Langelier Index	-	-	0.916	0.817	1.03	0.876	0.913	1.07
Total Hardness (as CaCO3)	mg/L	-	290	300	370	290	280	470
Total Dissolved Solids	mg/L	-	440	350	430	320	280	640
Alkalinity (as CaCO3)	mg/L	-	250	180	320	170	240	290
Bicarbonate (as CaCO3)	mg/L	-	250	180	320	160	240	280
Carbonate (as CaCO3)	mg/L	-	2.0	1.4	2.1	1.8	1.9	2.0
Chloride	mg/L	790	93	24	38	7.3	3.8	160
Nitrate as N	mg/L	-	<0.10	15.0	0.37	14.8	0.60	<0.10
Nitrite as N	mg/L	-	<0.010	<0.010	0.141	0.065	<0.010	<0.010
Sulphate	mg/L	-	10	16	13	20	6.1	15
Ortho Phosphate as P	mg/L	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ammonia as N	mg/L	-	0.30	0.097	0.082	0.49	<0.050	0.088
Total Phosphorus	mg/L	-						
Dissolved Organic Carbon	mg/L	-	3.3	3.0	1.8	1.7	1.9	4.8
Calcium	mg/L	-	110	120	140	110	110	170
Magnesium	mg/L	-	4.7	2.8	5.5	7.1	3.6	7.4
Sodium	mg/L	490	61	2.2	24	3.3	2.5	110
Potassium	mg/L	-	3	3	4	4	<1	1
Aluminum	mg/L	-						
Antimony	mg/L	0.006						
Arsenic	mg/L	0.025						
Barium	mg/L	1						
Beryllium	mg/L	0.004						
Boron	mg/L	5						
Cadmium	mg/L	0.0027						
Chromium	mg/L	0.050						
Cobalt	mg/L	0.0038						
Copper	mg/L	0.087	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron	mg/L	-	0.16	<0.02	0.31	<0.02	<0.02	0.65
Lead	mg/L	0.01						
Manganese	mg/L	-	0.39	0.03	0.65	0.12	0.02	0.15
Molybdenum	mg/L	0.07						
Nickel	mg/L	0.100						
Selenium	mg/L	0.01						
Silicon	mg/L							
Silver	mg/L	0.0015						
Strontium	mg/L	-						
Thallium	mg/L	0.002						
Titanium	mg/L	-						
Uranium	mg/L	0.02						
Vanadium	mg/L	0.0062						
Zinc	mg/L	1.1	<0.01	<0.01	0.01	<0.01	<0.01	<0.01

NOTES

1) Table 2 SCS = Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (April 2011).

2) Yellow shading indicates parameter reportable detection limit exceeds Table 2 SCS.

Table 4
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (KING SMOKE TREE CLIMATE STATION)
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Year of Climate Data Used	Total Adjusted Potential Evapotranspiration	Total Water Surplus	Total Precipitation	Soil Type	Land Use	Water Holding Capacity	Total Actual Evapotranspiration	Total Moisture Surplus used for Water Balance
	mm/yr	mm/yr	mm/yr			mm/yr	mm/yr	mm/yr
CLIMATE NORMAL 1981-2010	583.9	273.8	857.7	Silt Loam	Residential Lawn	125	555.8	301.9
					Cultivated	200	564.8	292.9
					Uncultivated	250	567.8	289.9
					Woodland	400	573.8	283.9

NOTES:
1) Water Holding Capacity obtained from Environmental Design Criteria of the SWM Planning and Design Manual published by the MOE in 2003.

TABLE 5 WATER BALANCE SUMMARY
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

A. OVERALL WATER BALANCE

Characteristics		Pre-development		Post-development (w/ Recharge Mitigation)		Change	
		Volume (m^3/yr)	mm/yr	Volume (m^3/yr)	mm/yr	Volume (m^3/yr)	%
Input	Precipitation	230,843	858	230,843	858	0	0%
	Runon	2,483	9	2,483	9	0	0.0%
	Total In	**233,326**	**867**	**233,326**	**867**	**0**	**0.00%**
Output	Infiltration via Pervious Areas	61,037	227	46,804	174	-14,233	-23%
	Infiltration via Bioswales/Stormtech	0	0	29,296	109	29,296	> 100%
	Total Infiltration	61,037	227	76,100	283	15,063	**25%**
	Run-off (Total)	20,670	77	65,589	244	44,919	217.3%
	Runoff into Bioswales/Stormtech	0	0	-29,296	-109	-29,296	>100%
	Run-off (Net)	20,670	77	36,293	134.8	15,623	75.6%
	Evapotranspiration	151,620	563	120,933	449	-30,687	-20.2%
	Total Out	**233,326**	**867**	**233,326**	**867**	**0**	**0.00%**

B. BREAKDOWN OF OFF-SITE RUNOFF CHANGE - BY PRE-DEVELOPMENT DRAINAGE OUTLET

Outlets	Description	Contributing Cathcments - Pre-Development	Contributing Cathcments - Post-Development	Pre-Development Runoff		Post-development Runoff		Runoff Change*	
				Area (m^2)	Volume (m^3/yr)	Area (m^2)	Volume (m^3/yr)	(m^3/yr)	%
Off-Site South East	Flows off-site to the north, conveyed by on-site Lyons Creek and SWMP	A	201a, 201b, 205, 205a, 206a and 209	262,462	20,083	154,848	29,992	9,909	49%
Off-Site South West	Flows off-site to the northeast and east via overland flow	B	None	6,680	586	0	0	-586	-100%
Stormtech 3 Infiltration Chamber, overflow drains to the on-site channel	Infiltration through Stormtech 3 infiltration chamber in sub-catchment 203-628/630 and 205-627/629	None	203	0	0	7,527	839	839	>100%
Stormtech 4 Infiltration Chamber, overflow drains to the on-site channel	Infiltration through Stormtech 4 infiltration chamber in sub-catchment 209-631	None	204a, 204b, 204c, 206b and 207	0	0	61,737	3,246	3,246	>100%
Stormtech 7 Infiltration Chamber, overflow drains to the on-site channel	Infiltration through Stormtech 7 infiltration chamber in sub-catchment 209-632	None	202a, 202b and 202f	0	0	23,580	2,215	2,215	>100%
Total Runoff				269,142	20,670	247,693	36,293	15,623	-51%

TABLE 6 CONSTRUCTION DEWATERING ESTIMATES SUMMARY - RESIDENTIAL BUILDING FOUNDATIONS
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, ON

Lot Type	Lot Numbers	Length	Width	Area	Footing Depth Below Water Table	Footing Depth + 0.5m Below Water Table	Footing Depth Above Water Table	Construction				Number of lots	Total Estimated Value	Total Estimated Value with Safety Factor	Precipitation Contribution Per Building
								Anticipated Maximum ZOI (m)	Conservative Rate						
									Estimated Value	With Safety Factor	Maximum ZOI				
		(m)	(m)	(m^2)	(m)	(m)	(m)		(L/day)	(L/day)	(m)		(L/day)	(L/day)	(L/day)
A	41,42,43,50,59	20.2	13.2	266.6	NA	NA	1.0-2.0	1	0	0	0	5	0	0	2,666
A	60	20.2	13.2	266.6	NA	NA	2.0-3.0	1	0	0	0	1	0	0	2,666
B	21, 22	21.5	13.2	283.8	NA	NA	0-1.0	5	0	0	0	2	0	0	2,838
B	18,19,20,44,45,46,47,48,51,52,53,54,58	21.5	13.2	283.8	NA	NA	1.0-2.0	5	0	0	0	13	0	0	2,838
B	33,34,54,55,56,62,63	21.5	13.2	283.8	NA	NA	2.0-3.0	5	0	0	0	7	0	0	2,838
C	4-17,27-31,40,49	23.6	13.2	311.5	NA	NA	1.0-2.0	1	0	0	0	21	0	0	3,115
C	1-3, 23-26, 32,35-39,61,64,65-71,105-108	23.6	13.2	311.5	NA	NA	2.0-3.0	1	0	0	0	26	0	0	3,115
C	70-82,94-102,107-114,115-118,138-140	23.6	13.2	311.5	NA	NA	3.0-4.0	1	0	0	0	37	0	0	3,115
C	83-93, 119-137	23.6	13.2	311.5	NA	NA	4.0-5.0	1	0	0	0	30	0	0	3,115
									0	0		142	0	0	26308
Total								**-**	**0**	**0**	**-**		**0**	**0**	**26,000**

Note: NA - Not Applicable

TABLE 7 LONG-TERM DRAINAGE DEWATERING ESTIMATES SUMMARY - RESIDENTIAL BUILDING FOUNDATIONS
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, ON

Building Type	Lot Numbers	Length	Width	Area	Footing Depth Below Water Table	Footing Depth Above Water Table	Construction			Number of lots	Total Estimated Value	Total Estimated Value with Safety Factor
							Estimated Value	With Safety Factor	Maximum ZOI			
		(m)	(m)	(m^2)	(m)	(m)	(L/day)	(L/day)	(m)		(L/day)	(L/day)
A	41,42,43,50,59	20.2	13.2	266.6	NA	1.0-2.0	0	0	0	5	0	0
A	60	20.2	13.2	266.6	NA	2.0-3.0	0	0	0	1	0	0
B	21, 22	21.5	13.2	283.8	NA	0-1.0	0	0	0	2	0	0
B	18,19,20,44,45,46,47,48, 51,52,53,54,58	21.5	13.2	283.8	NA	1.0-2.0	0	0	0	13	0	0
B	33,34,54,55,56,62,63	21.5	13.2	283.8	NA	2.0-3.0	0	0	0	7	0	0
C	4-17,27-31,40,49	23.6	13.2	311.5	NA	1.0-2.0	0	0	0	21	0	0
C	1-3, 23-26, 32,35-39,61,64,65-71,105-108	23.6	13.2	311.5	NA	2.0-3.0	0	0	0	26	0	0
C	70-82,94-102,107-114,115-118,138-140	23.6	13.2	311.5	NA	3.0-4.0	0	0	0	37	0	0
C	83-93, 119-137	23.6	13.2	311.5	NA	4.0-5.0	0	0	0	30	0	0
							0	0		142	0	0
Total							**0**	**0**	**-**		**0**	**0**

Note: NA - Not Applicable

TABLE 8 CONSTRUCTION DEWATERING ESTIMATES SUMMARY - UTILITIES
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, ON

Servicing Segment	Type of Servicing	Total Trench Length	Maximum Open Trench Length During Construction	Width	Sewer Depth Below Water Table	Sewer Depth + 1.0 m Below Water Table	Sewer Depth Above Water Table	Sewer Depth + 1.0 Below Water Table	Construction Conservative Rate			Number of Trench Segments	Total Estimated Value	Total Estimated Value with Safety Factor	Precipitation Contribution Per Trench
									Estimated Value Per Trench	With Safety Factor	Maximum ZOI				
		(m)	(m)	(m)	(m)	(m)	(m)	(m)	(L/day)	(L/day)	(m)		(L/day)	(L/day)	(L/day)
Between: SAN MH105A and MH106A SAN MH106A and MH107A SAN MH115A and MH104A SAN MH118A and MH119A SAN MH12A and MH5A	Sanitary (200mm dia.)	405.9	50	1.2	NA	NA	0-1.0	0-1.0	5,959	8,939	18	8.1	48,376	72,563	600
Between: SAN MH106A and MH108A SAN MH110A and MH112A SAN MH112A and MH114A SAN MH114A and MH118A SAN MH115A and MH104A SAN MH118A and MH120A SAN MH120A and MH12A	Sanitary (200mm dia.)	524.6	50	1.2	0-1.0	1.0-2.0	NA	NA	17,502	26,254	36	10.5	183,635	275,452	600
Between: SAN MH109A and MH110A SAN MH110A and MH112A SAN MH112A and MH113A SAN MH 113A and MH114A SAN MH118A and PSMH SAN MH120A and MH12A	Sanitary (200mm dia.)	138.4	50	1.2	1.0-2.0	2.0-3.0	NA	NA	33,774	50,661	54	2.8	93,487	140,231	600
Between SAN MH120A and PSMH	Sanitary (200mm dia.)	25.0	25	1.2	>2.0	>3.0	NA	NA	30,015	45,022	54	1.0	30,015	45,022	300
Between: SAN MH105A and MH106A SAN MH118A and MH119A SAN MH7A and MH6A SAN MH7A and MH2A SAN MH8A and MH9A	Sanitary (200mm dia.)	311.7	50	1.2	NA	NA	1.0-2.0	NA	0	0	0	6.2	0	0	600
Between: SAN MH 2A and MH1A SAN MH1A and MH9A	Sanitary (200mm dia.)	168.2	50	1.2	NA	NA	2.0-3.0	NA	0	0	0	3.4	0	0	600
Between SAN MH1A and MH8A	Sanitary (200mm dia.)	52.0	50	1.2	NA	NA	>3.0	NA	0	0	0	1.0	0	0	600
									87250	130876			355513	533269	3900
							Sub Total for Sanitary Sewers		**87,000**	**130,500**			**356,000**	**533,000**	**4,000**
Between: STM MH116 and 117 STM MH118 and MH114 STM MH114 and MH112	Storm Box Pipe (1800 x 900 mm)	125.7	50.0	2.8	NA	NA	0-1.0	0-1.0	7,444	11,167	18	2.5	133,626	28,073	1,400
Between: STM MH114 and MH113 STM MH101 and MH102	Storm (300mm dia.)	63.5	50.0	1.3	NA	NA	0-1.0	0-1.0	6,079	9,118	18	1.3	109,110	11,580	650
Between: STM MH109 and MH108	Storm (375mm dia.)	38.3	38.3	1.4	NA	NA	0-1.0	0-1.0	5,772	8,658	18	1.0	103,611	8,658	527
Between: STM MH106 and MH107	Storm (525mm dia.)	44.2	44.2	1.5	NA	NA	0-1.0	0-1.0	6,134	9,201	18	1.0	110,106	9,201	674
Between: STM MH107 and MH109 STM MH109 and MH110	Storm (825mm dia.)	67.3	50.0	1.8	NA	NA	0-1.0	0-1.0	6,630	9,945	18	1.3	119,004	13,386	913
Between: STM MH116 and MH117 STM MH117 and MH118 STM MH118 and HW4 STM MH118 and MH114 STM MH114 and MH112	Storm Box Pipe (1800 x 900 mm)	158.4	50.0	2.8	0-1.0	1.0-2.0	NA	NA	20,978	31,468	36	3.2	753,123	99,690	1,400
Between: STM MH102 and MH103	Storm (450mm dia.)	67.0	50.0	1.5	0-1.0	1.0-2.0	NA	NA	18,190	27,284	36	1.3	653,005	36,561	725
Between: STM MH103 and MH107	Storm (600mm dia.)	77.5	50.0	1.6	0-1.0	1.0-2.0	NA	NA	18,566	27,849	36	1.6	666,506	43,165	800
Between: STM MH107 and MH110	Storm (825mm dia.)	67.5	50.0	1.8	0-1.0	1.0-2.0	NA	NA	19,089	28,634	36	1.4	685,309	38,656	913
Between STM MH115 and MH116	Storm (450mm dia.)	36.7	36.7	1.5	NA	NA	1.0-2.0	NA	0	0	0	1.0	0	0	532
Between STM MH104 and MH105	Storm (300mm dia.)	41.0	41.0	1.3	NA	NA	1.0-2.0	NA	0	0	0	1.0	0	0	533
Between: STM MH105 and MH106 STM MH108 and MH109	Storm (375mm dia.)	66.6	50.0	1.4	NA	NA	1.0-2.0	NA	0	0	0	1.3	0	0	688
Between: STM MH106 and MH107 STM MH3 and MH7 STM MH12 to LID3	Storm (525mm dia.)	86.2	50.0	1.5	NA	NA	1.0-2.0	NA	0	0	0	1.7	0	0	763
Between: STM MH110 and LID7 LID7 and HW3 STM MH7 and MH8 STM MH8 and LID4	Storm (825mm dia.)	145.4	50.0	1.8	NA	NA	1.0-2.0	NA	0	0	0	2.9	0	0	913
Between: STM MH6 and MH7	Storm (675mm dia.)	55.1	50.0	1.7	NA	NA	1.0-2.0	NA	0	0	0	1.1	0	0	838
Between: STM MH115 and MH116 STM MH3 and MH1 STM MH12 and MH11 STM MH11 and MH10 STM MH5 and MH6	Storm (450mm dia.)	245.3	50.0	1.5	NA	NA	2.0-3.0	NA	0	0	0	4.9	0	0	725
Between: STM MH2 and MH3 STM MH1 and MH12 STM MH9 and MH4	Storm (300mm dia.)	90.0	50.0	1.3	NA	NA	2.0-3.0	NA	0	0	0	1.8	0	0	650
Between: STM MH10 and MH9	Storm (375mm dia.)	14.0	14.0	1.4	NA	NA	2.0-3.0	NA	0	0	0	1.0	0	0	193
Between: STM MH6 and MH7	Storm (675mm dia.)	55.0	50.0	1.7	NA	NA	2.0-3.0	NA	0	0	0	1.1	0	0	838
Between STM MH3 and MH7	Storm (525mm dia.)	38.2	38.2	1.5	NA	NA	2.0-3.0	NA	0	0	0	1.0	0	0	583
Between STM MH4 and MH9	Storm (300mm dia.)	29.2	29.2	1.3	NA	NA	>3.0	NA	0	0	0	1.0	0	0	380
Between STM MH4 and MH5	Storm (375mm dia.)	37.0	37.0	1.4	NA	NA	>3.0	NA	0	0	0	1.0	0	0	509
Between STM MH5 and MH6	Storm (450mm dia.)	34.6	34.6	1.5	NA	NA	>3.0	NA	0	0	0	1.0	0	0	502
									108882	163323	233	36	3333400	288969	16643
							Sub Total for Storm Sewers		**109,000**	**163,500**			**3,333,000**	**289,000**	**17,000**
									196133	294199			3688912	822238	20543
							Total		**196,000**	**294,000**			**3,689,000**	**822,000**	**21,000**

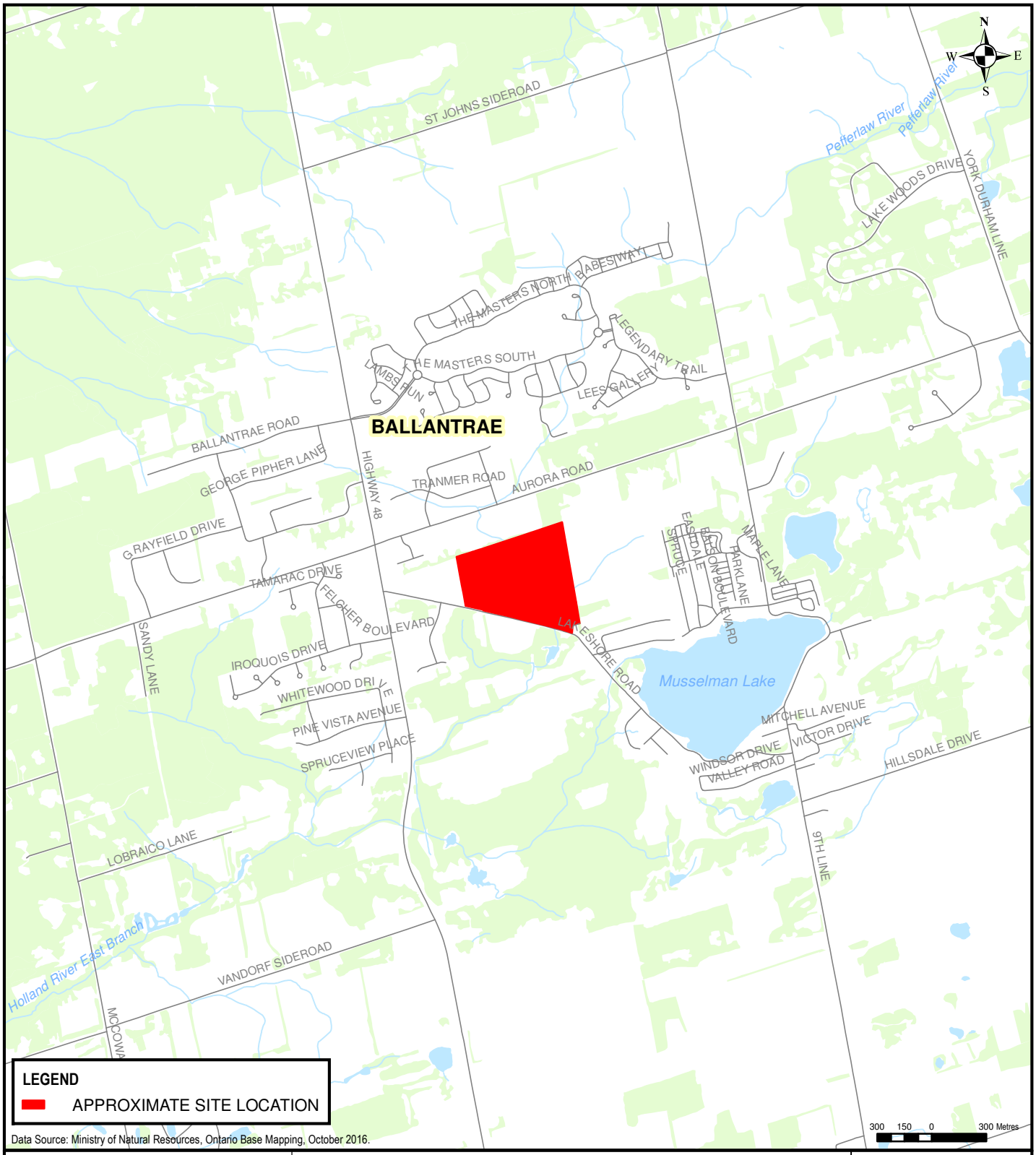
Note: NA - Not Applicable

TABLE 9 CONSTRUCTION DEWATERING ESTIMATES SUMMARY - STORMTECH INFILTRATION CHAMBERS
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, ON

LID Number	Type of LID	Length	Width	Area	Granular Depth Above Water Table	Construction Conservative Rate			Precipitation Contribution
						Estimated Value	With Safety Factor	Maximum ZOI	
		(m)	(m)	(m^2)	(m)	(L/day)	(L/day)	(m)	(L/day)
LID 3	StormTech	30	18	540	1.0-2.0	0	0	0	5,400
LID 4	StormTech	97	20	1940	1.0-2.0	0	0	0	19,400
LID 7	StormTech	50	39	1950	1.0-2.0	0	0	0	19,500
					Total	**0**	**0**		**44,000**

Note: NA - Not Applicable

FIGURES

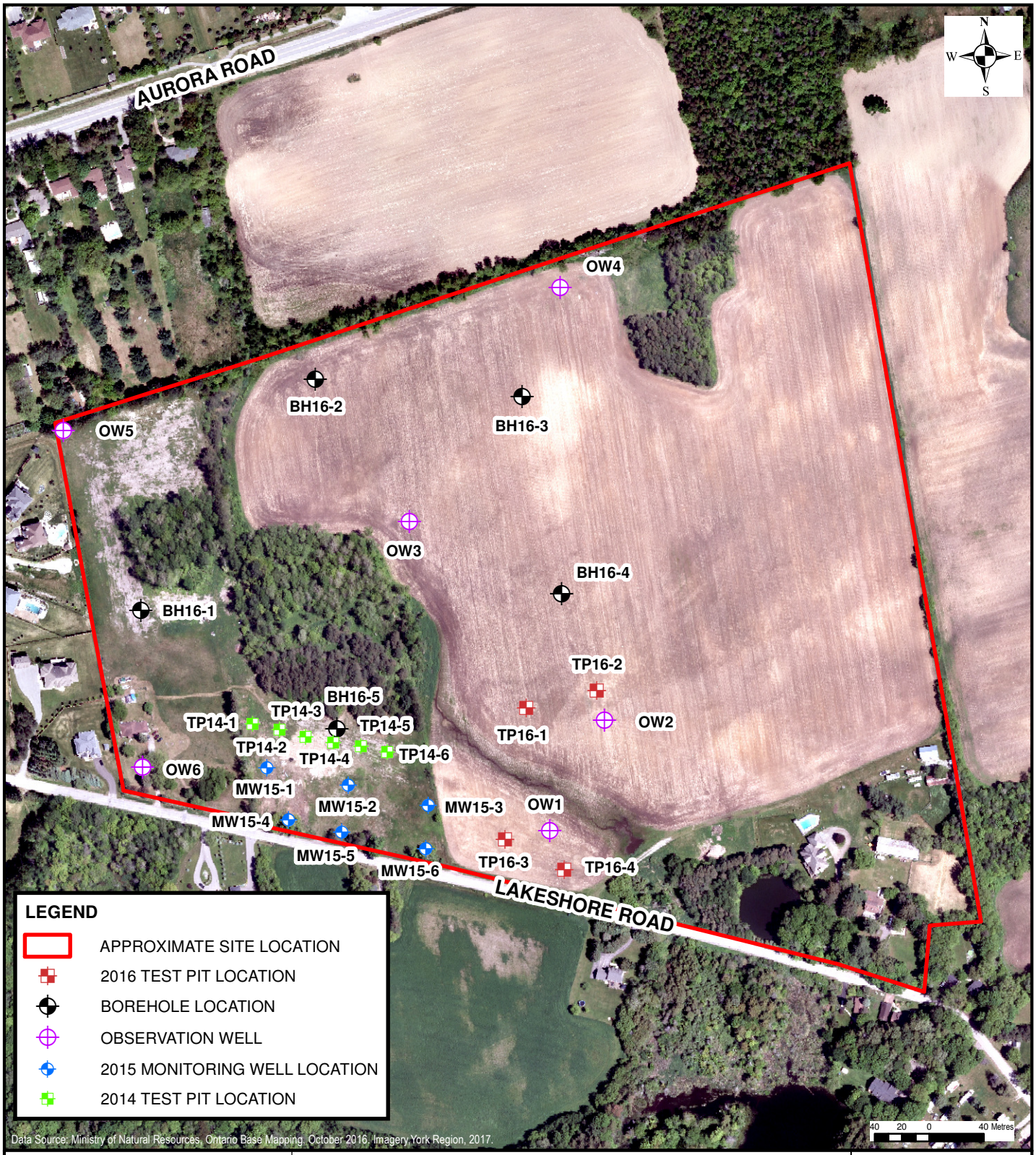


wsp

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY 5426, 5452 & 5584 LAKESHORE ROAD BALLANTRAE, ONTARIO	SCALE: 1:30,000
	DRAWN BY: TP / CHECKED BY: LL
TITLE: SITE LOCATION MAP	PROJECT NO: 161-06960-01
	DATE: APRIL 2021
CLIENT: FAR SIGHT HOMES	FIGURE NO: 1 / REV.: -

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 1 Location Map.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

TITLE: EXISTING CONDITIONS

CLIENT: FAR SIGHT HOMES

SCALE: 1:4,000

DRAWN BY: TP

CHECKED BY: LL

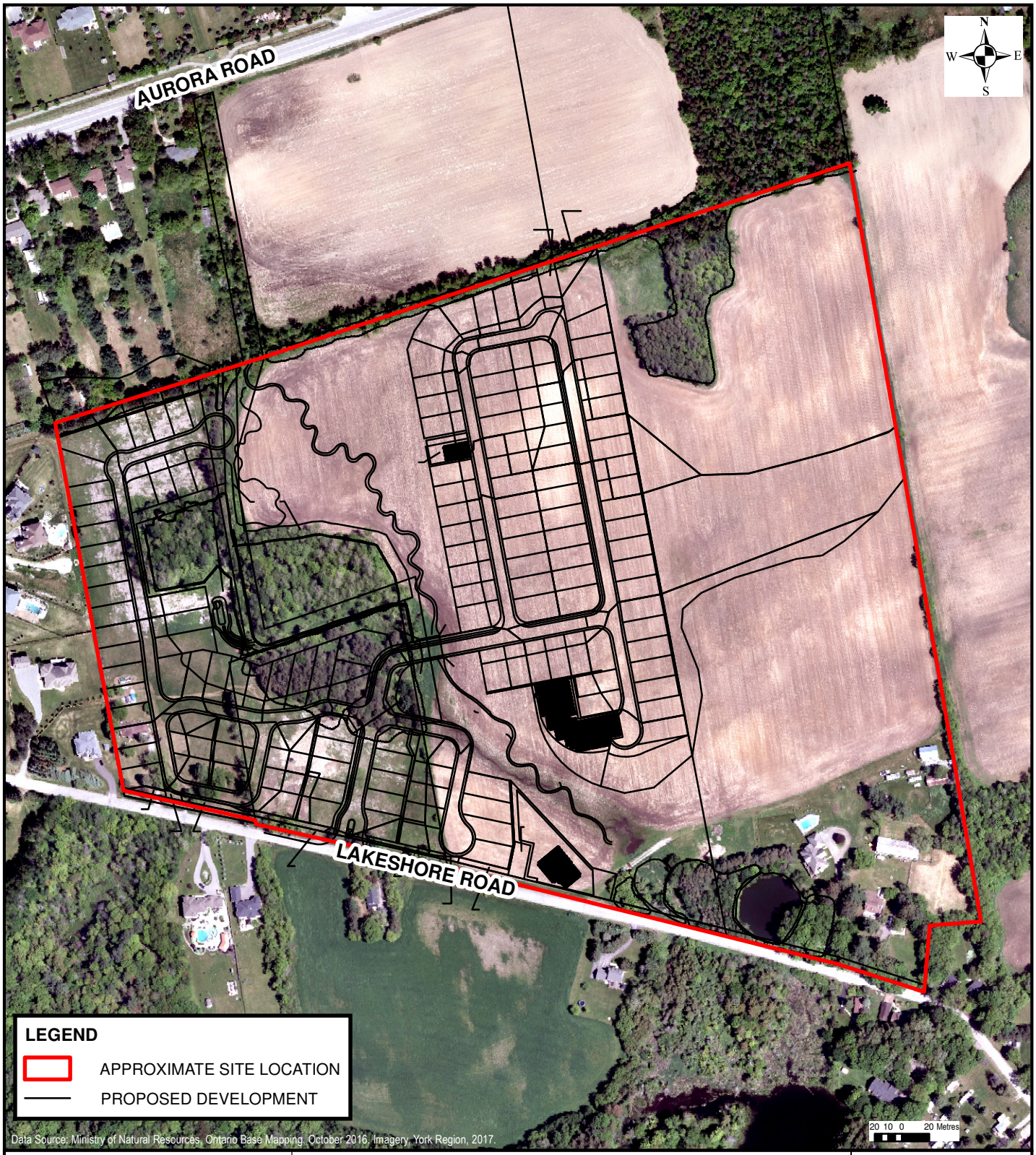
PROJECT NO: 161-06960-01

DATE: APRIL 2021

FIGURE NO: 2

REV.: -

Document Path: D:\a\Projects\161-06960-01\2020\MXD\161-06960-01 Figure 2 Existing Conditions.mxd



Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016, Imagery, York Region, 2017.

wsp
126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

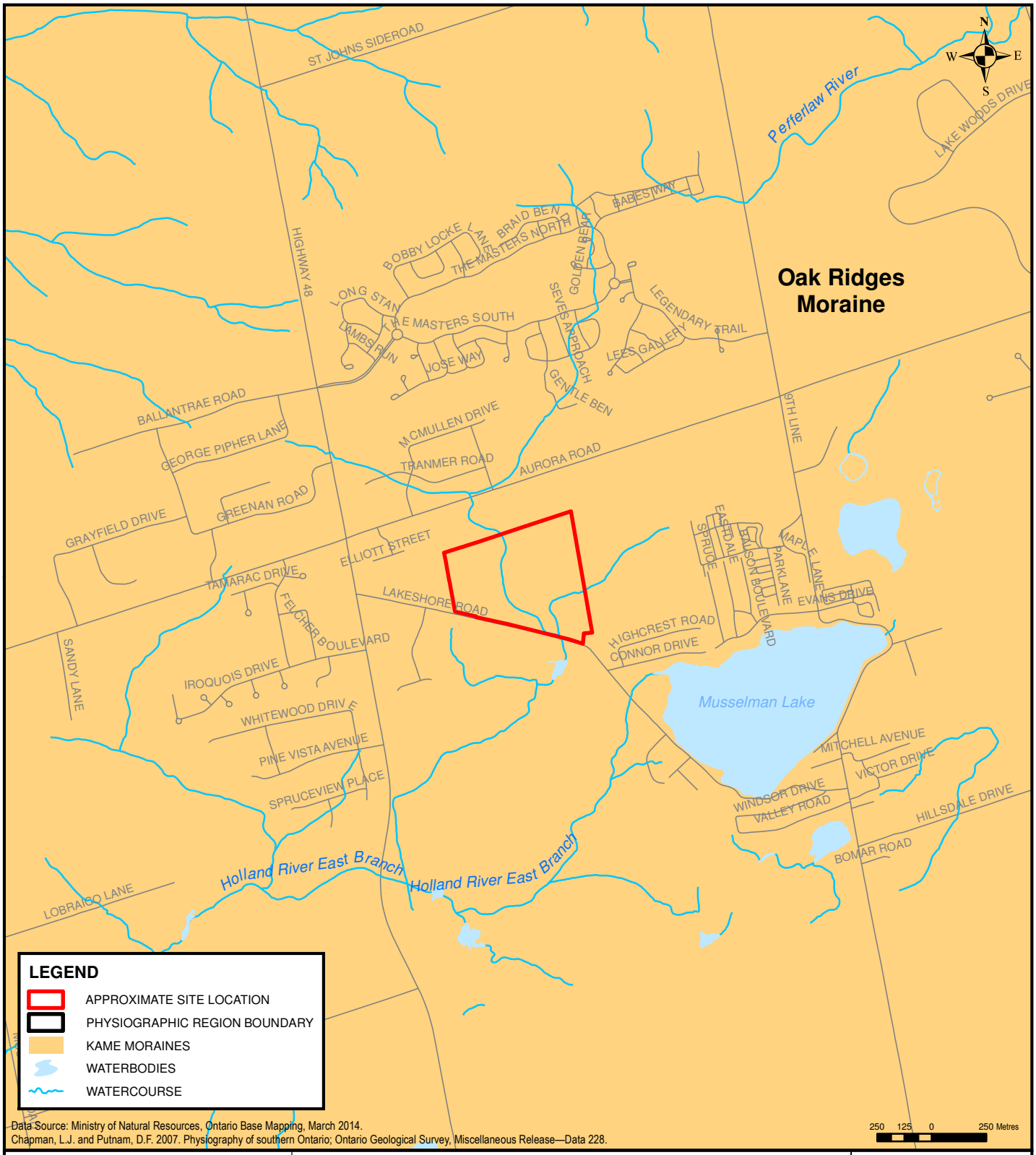
PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

TITLE: PROPOSED DEVELOPMENT

CLIENT: FAR SIGHT HOMES

SCALE:	1:4,000
DRAWN BY:	TP
CHECKED BY:	LL
PROJECT NO:	161-06960-01
DATE:	APRIL 2021
FIGURE NO:	3
REV.:	-

Document Path: D:\a\Projects\161-06960-01\20200\MXD\161-06960-01 Figure 3 Proposed Development2.mxd



LEGEND

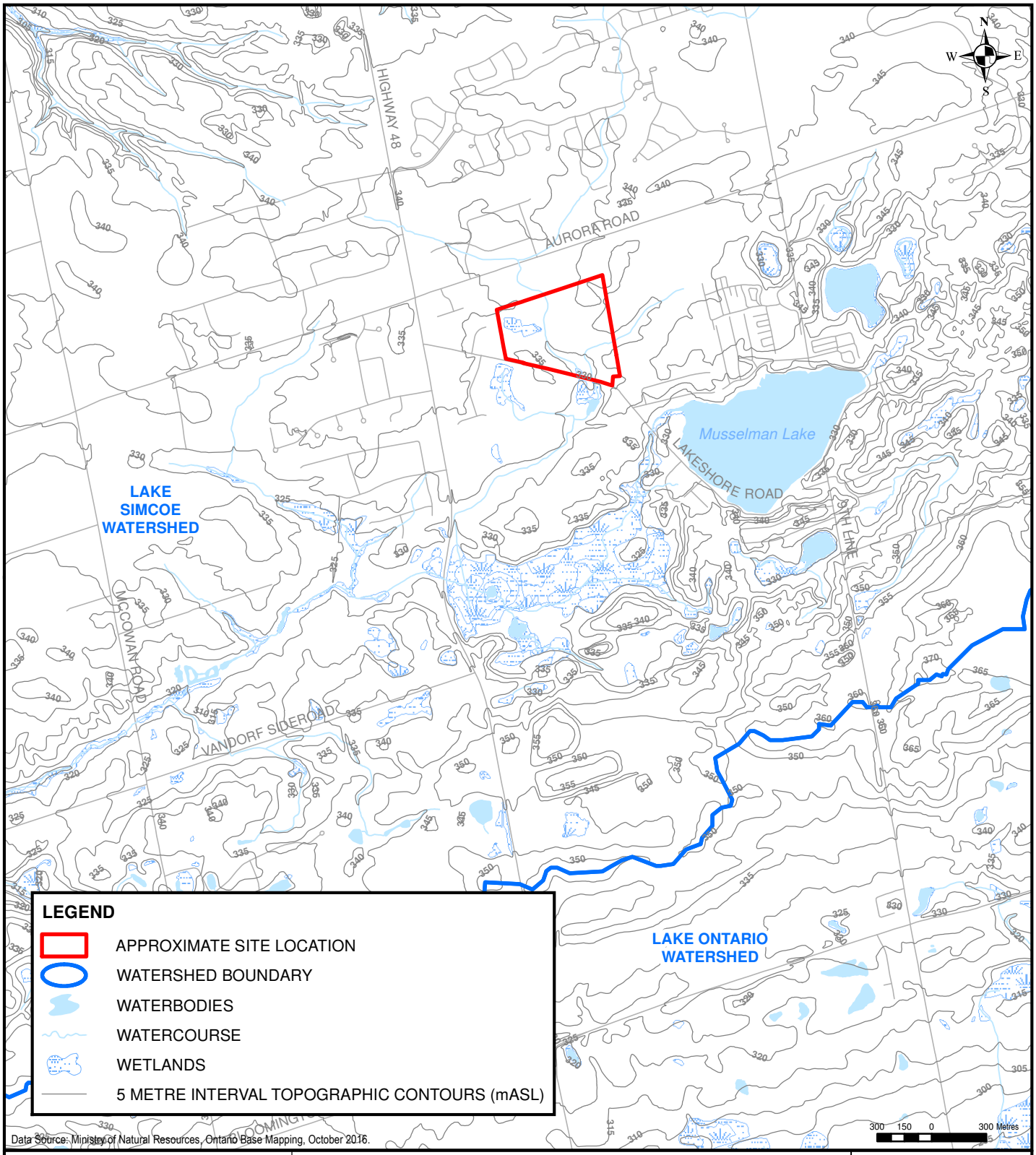
- APPROXIMATE SITE LOCATION
- PHYSIOGRAPHIC REGION BOUNDARY
- KAME MORAINES
- WATERBODIES
- WATERCOURSE

Data Source: Ministry of Natural Resources, Ontario Base Mapping, March 2014.
Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 228.

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY 5426, 5452 & 5584 LAKESHORE ROAD BALLANTRAE, ONTARIO	SCALE: 1:25,000
	DRAWN BY: TP / CHECKED BY: LL
TITLE: REGIONAL PHYSIOGRAPHY	PROJECT NO: 161-06960-01
	DATE: APRIL 2021
CLIENT: FAR SIGHT HOMES	FIGURE NO: 4 / REV.: -

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 4 Physiography.mxd

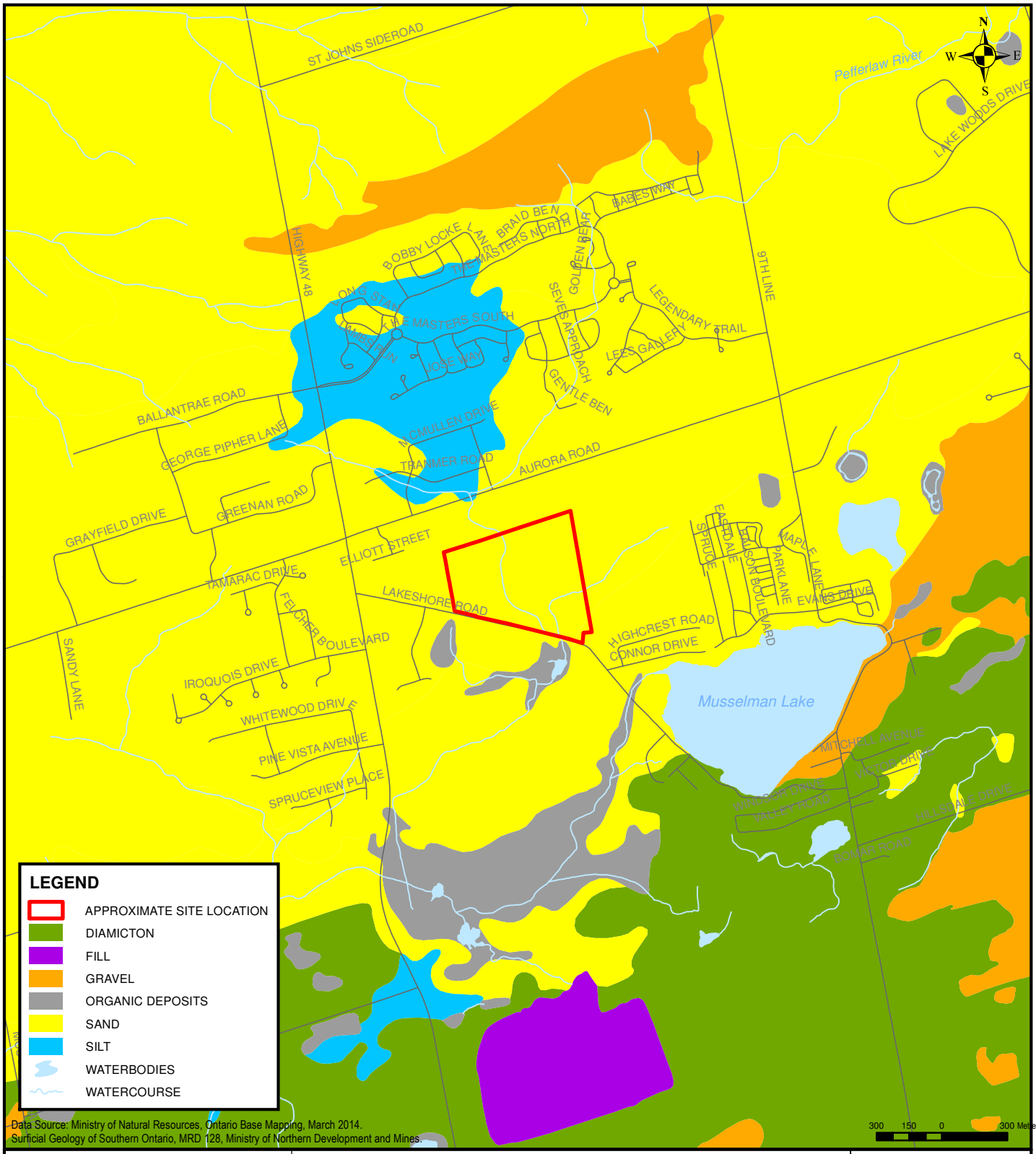


Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY 5426, 5452 & 5584 LAKESHORE ROAD BALLANTRAE, ONTARIO	SCALE: 1:30,000
	DRAWN BY: TP / CHECKED BY: LL
TITLE: REGIONAL TOPOGRAPHY AND DRAINAGE	PROJECT NO: 161-06960-01
	DATE: APRIL 2021
CLIENT: FAR SIGHT HOMES	FIGURE NO: 5 / REV.: -

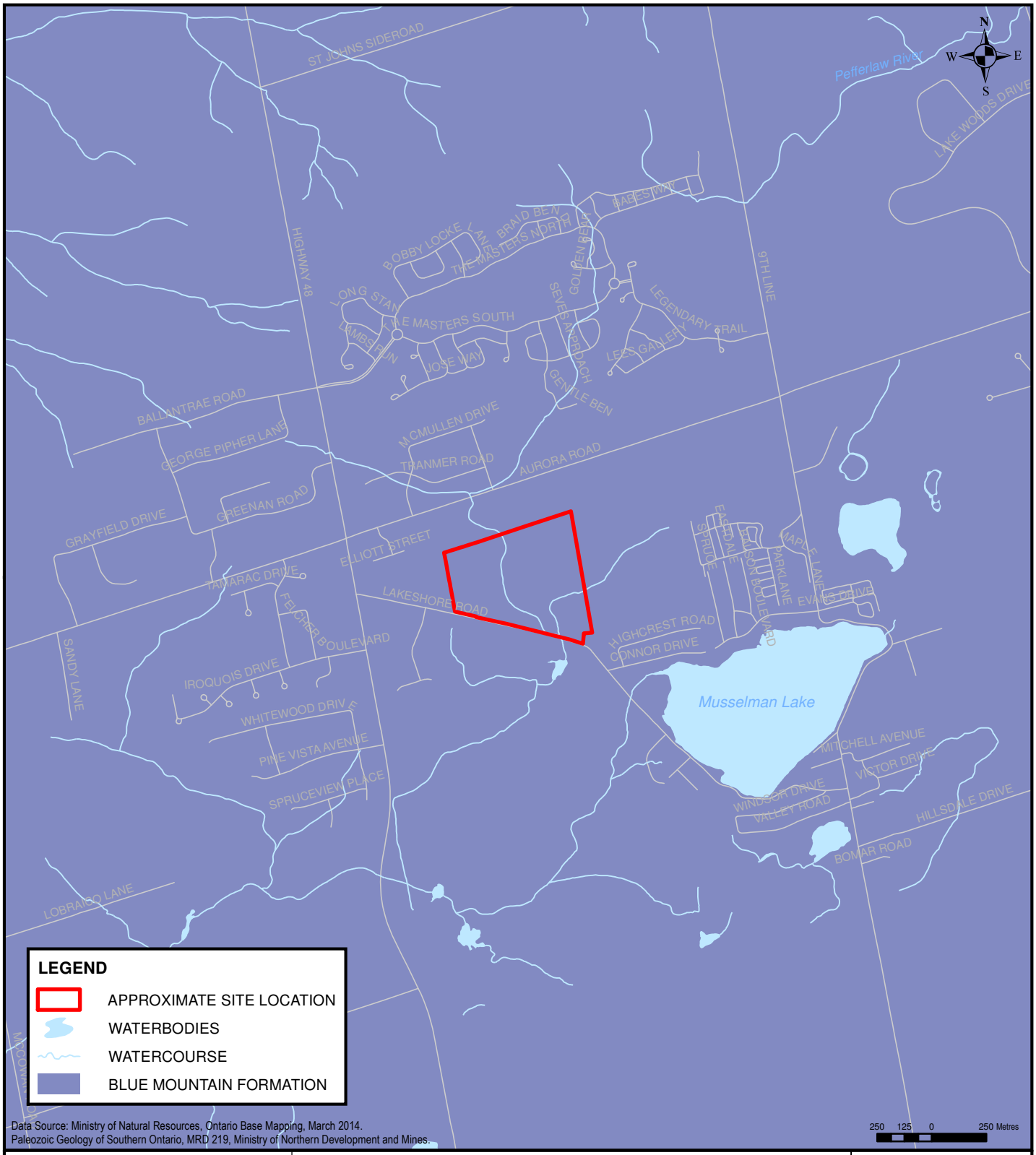
Document Path: D:\a\Projects\161-06960-01\2020\MXD\161-06960-01 Figure 5 Drainage.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY 5426, 5452 & 5584 LAKESHORE ROAD BALLANTRAE, ONTARIO	SCALE: 1:25,000
	DRAWN BY: TP / CHECKED BY: LL
TITLE: SURFICIAL GEOLOGY	PROJECT NO: 161-06960-01
	DATE: APRIL 2021
CLIENT: FAR SIGHT HOMES	FIGURE NO: 6 / REV.: -

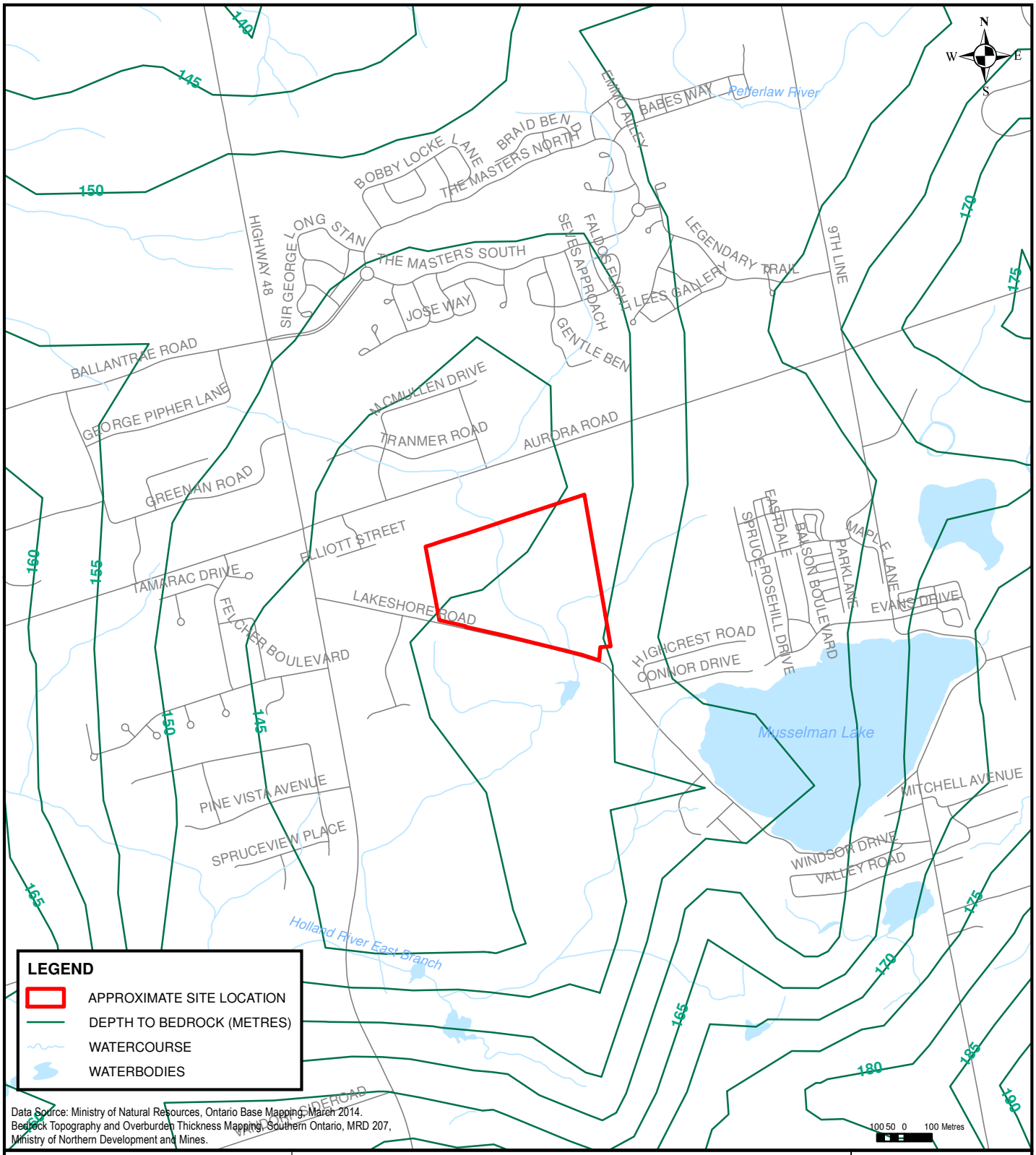
Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 6 Surficial Geology.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY 5426, 5452 & 5584 LAKESHORE ROAD BALLANTRAE, ONTARIO	SCALE: 1:25,000
	DRAWN BY: TP / CHECKED BY: LL
TITLE: BEDROCK GEOLOGY	PROJECT NO: 161-06960-01
	DATE: APRIL 2021
CLIENT: FAR SIGHT HOMES	FIGURE NO: 7 / REV.: -

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 7 Bedrock Geology.mxd



LEGEND

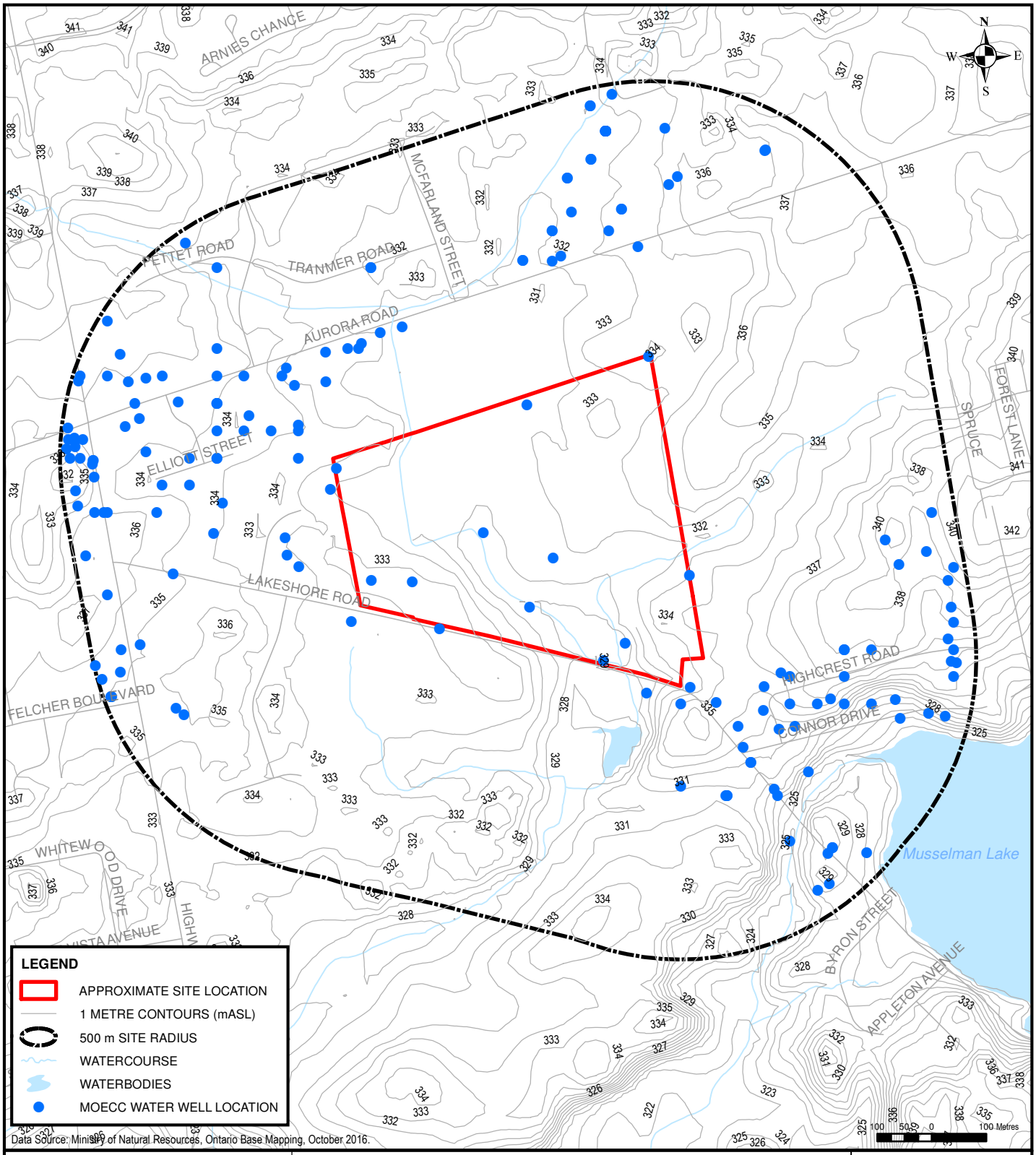
- APPROXIMATE SITE LOCATION
- DEPTH TO BEDROCK (METRES)
- WATERCOURSE
- WATERBODIES

Data Source: Ministry of Natural Resources, Ontario Base Mapping, March 2014.
Bedrock Topography and Overburden Thickness Mapping, Southern Ontario, MRD 207, Ministry of Northern Development and Mines.

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY 5426, 5452 & 5584 LAKESHORE ROAD BALLANTRAE, ONTARIO	SCALE: 1:20,000
	DRAWN BY: TP / CHECKED BY: LL
TITLE: OVERBURDEN THICKNESS	PROJECT NO: 161-06960-01
	DATE: APRIL 2021
CLIENT: FAR SIGHT HOMES	FIGURE NO: 8 / REV.: -

Document Path: D:\a\Projects\161-06960-01\2020\MXD\161-06960-01 Figure 8 Overburden Thickness.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

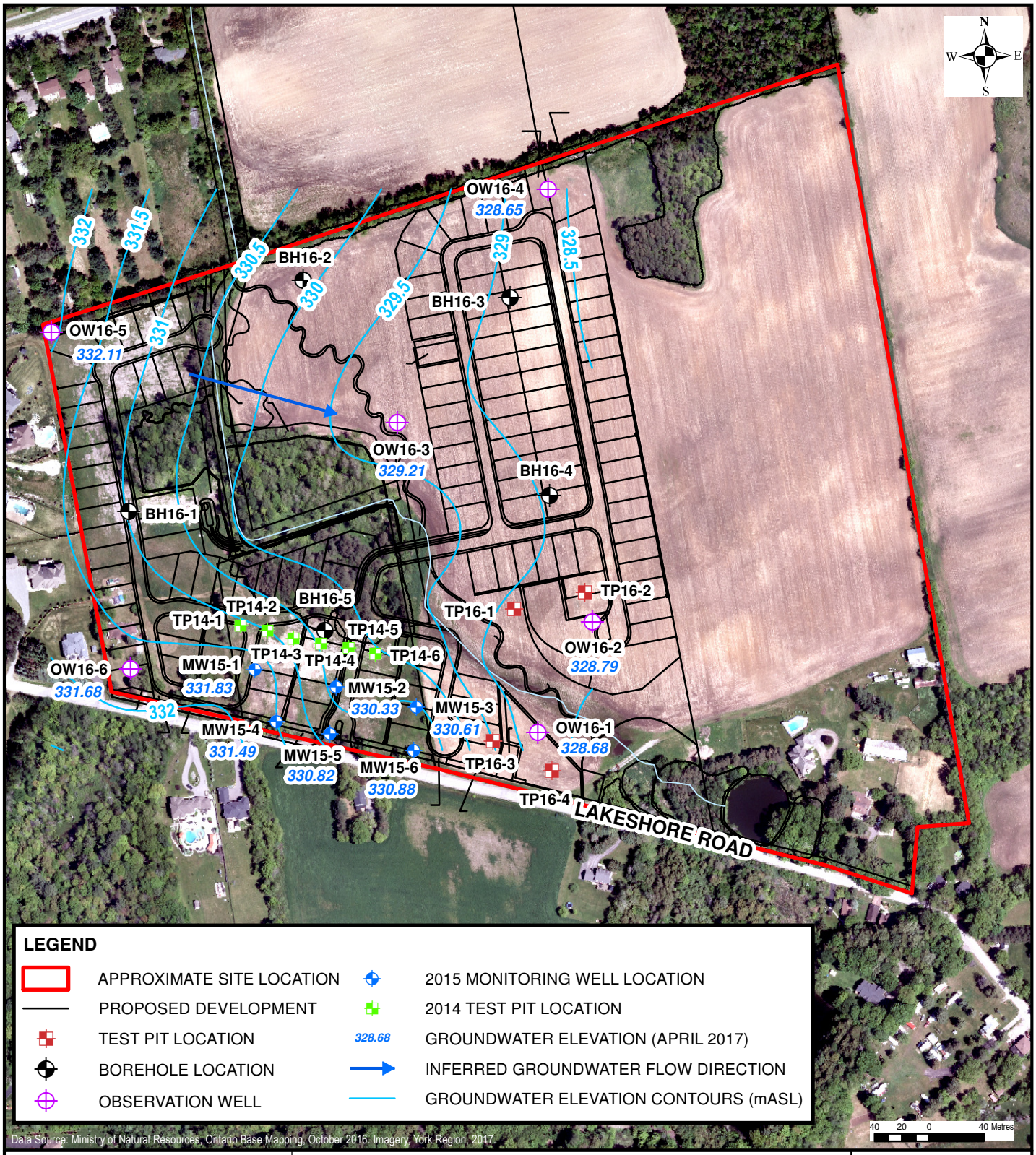
PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

TITLE: MOECC WATER WELLS

CLIENT: FAR SIGHT HOMES

SCALE:	1:10,000
DRAWN BY:	TP
CHECKED BY:	LL
PROJECT NO:	161-06960-01
DATE:	APRIL 2021
FIGURE NO:	9
REV.:	-

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 9 MOECC Wells.mxd



LEGEND

- APPROXIMATE SITE LOCATION
- PROPOSED DEVELOPMENT
- TEST PIT LOCATION
- BOREHOLE LOCATION
- OBSERVATION WELL
- 2015 MONITORING WELL LOCATION
- 2014 TEST PIT LOCATION
- 328.68 GROUNDWATER ELEVATION (APRIL 2017)
- INFERRED GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION CONTOURS (mASL)

Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016. Imagery, York Region, 2017.

wsp

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

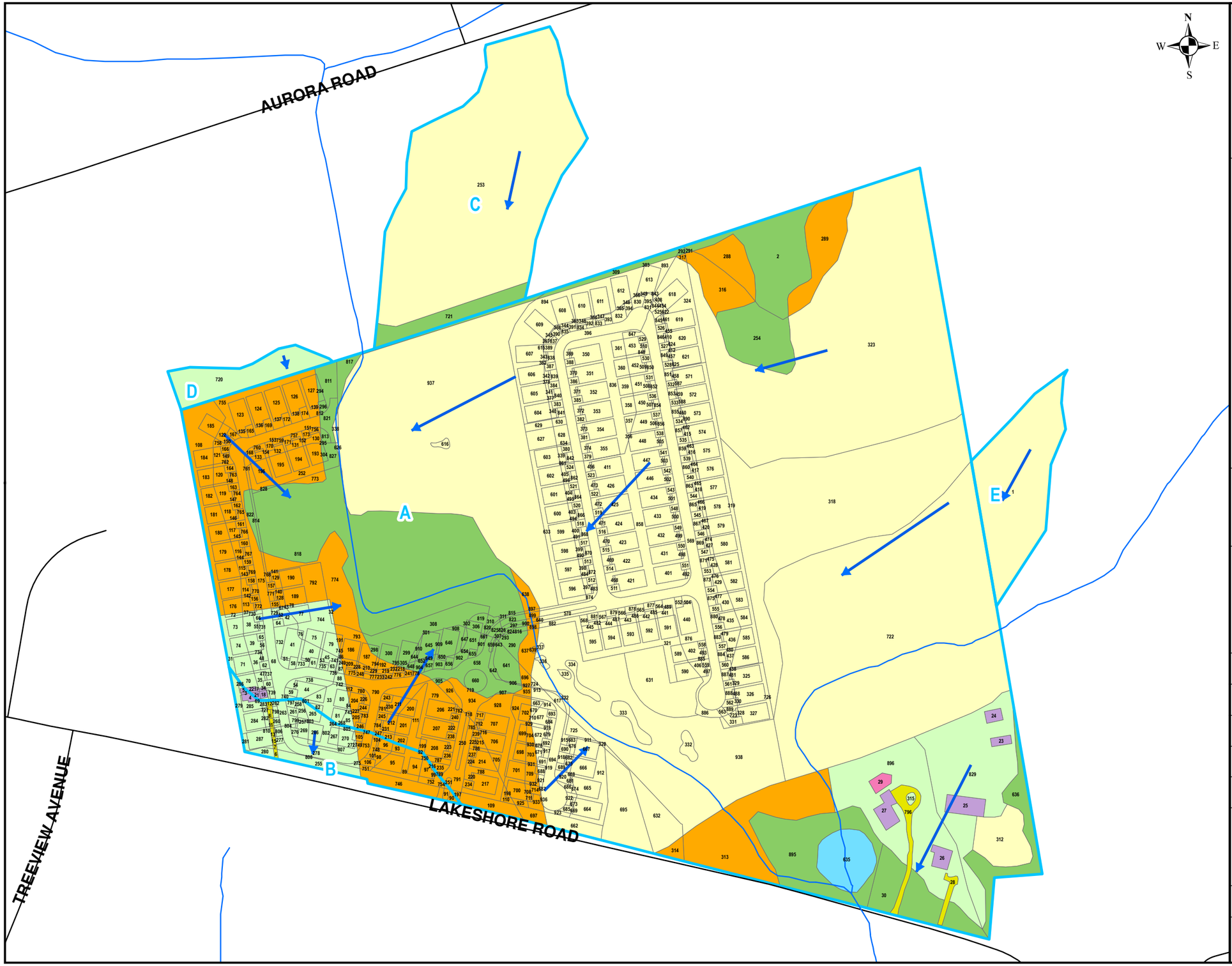
PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

TITLE: GROUNDWATER ELEVATIONS

CLIENT: FAR SIGHT HOMES

SCALE:	1:4,000
DRAWN BY:	TP
CHECKED BY:	LL
PROJECT NO:	161-06960-01
DATE:	APRIL 2021
FIGURE NO:	10
REV.:	-

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 10 Groundwater Flow Rev.mxd



wsp
126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- PRE DEVELOPMENT CATCHMENT AREAS
- BUILDING
- CULTIVATED
- DRIVEWAY
- GRAVEL
- LAWNS
- PATIO
- PONDS
- ROAD
- UNCULTIVATED
- WOODED AREAS
- PRE DEVELOPMENT FLOW DIRECTION
- WATERCOURSE

0 40 80 160 Metres

CLIENT:

FAR SIGHT HOMES

PROJECT:

HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

PROJECT NO:	DATE:
161-06960-01	APRIL 2021

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: LL

FIGURE NO:	SCALE:
11	1:3,000

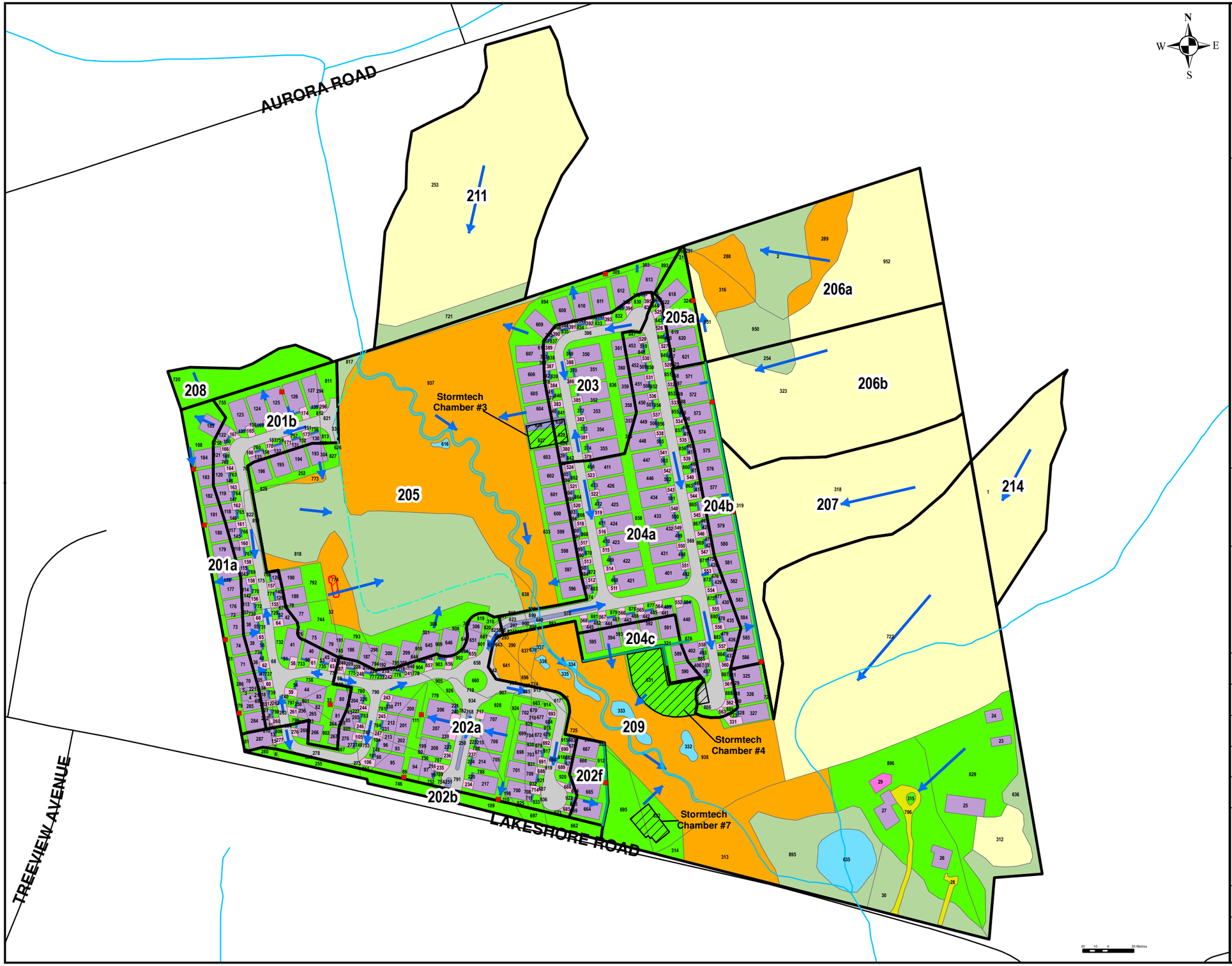
TITLE:

PRE DEVELOPMENT SITE CATCHMENT AREAS

DISCIPLINE: ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 11 Pre Development.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- POST DEVELOPMENT CATCHMENT AREAS
- BUILDING
- CONCRETE / WALKWAY
- CULTIVATED
- DRIVEWAY
- GRAVEL
- LAWNS
- PATIO
- PONDS
- PORCH
- ROAD
- UNCULTIVATED
- WOODED AREAS
- POST DEVELOPMENT FLOW DIRECTION
- CREEK REALIGNMENT
- CATCHBASIN
- DITCH
- BIOSWALE
- STORMTECH INFILTRATION CHAMBERS
- SAND FILTER & PLUNGE POOL

CLIENT:

FAR SIGHT HOMES

PROJECT:

HYDROGEOLOGICAL ASSESSMENT AND
WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

PROJECT NO:	DATE:
161-06960-01	APRIL 2021

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: LL

FIGURE NO:	SCALE:
12	1:3,000

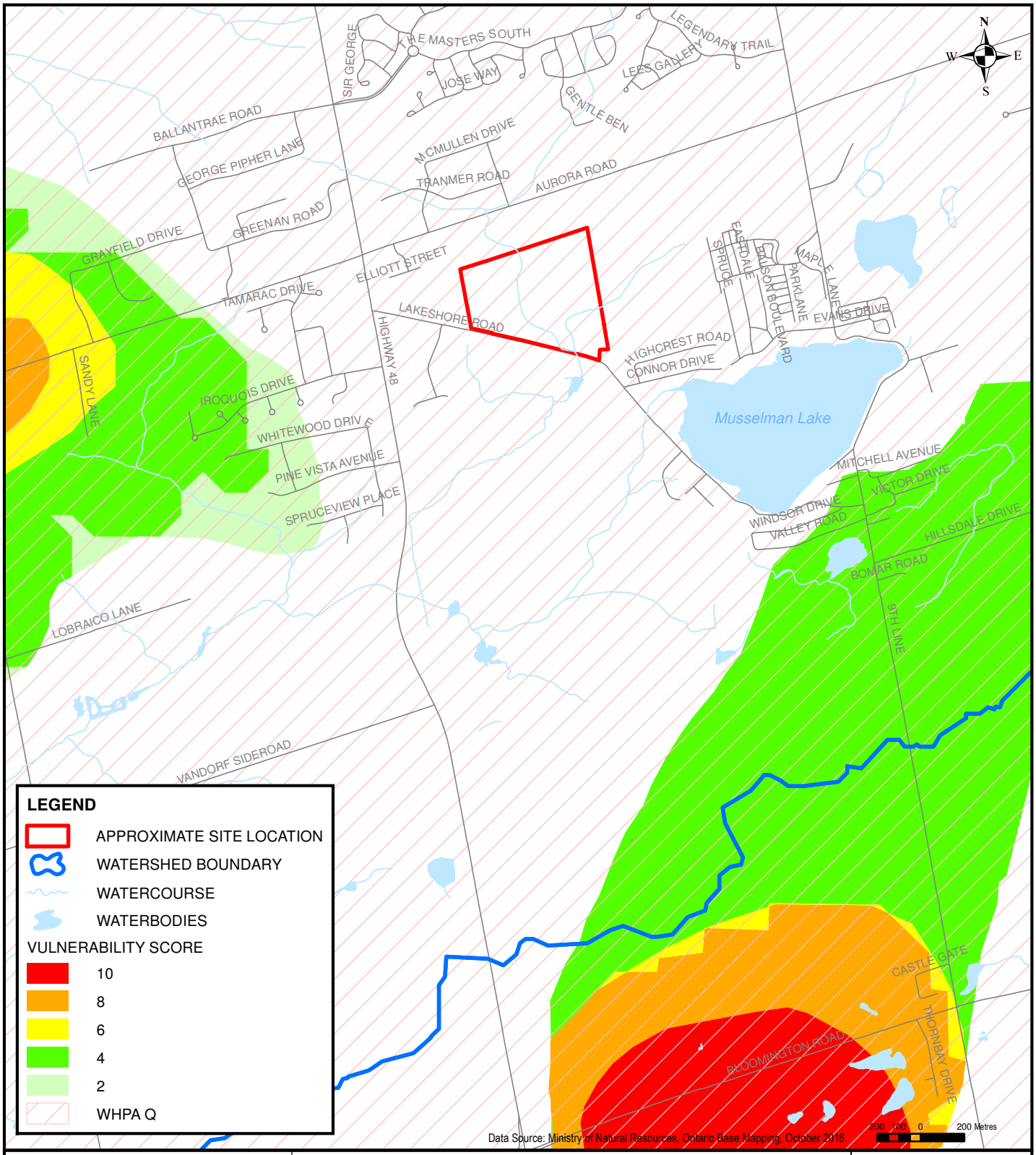
TITLE:

POST DEVELOPMENT SITE CATCHMENT AREAS

DISCIPLINE: ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 12 Post Development.mxd

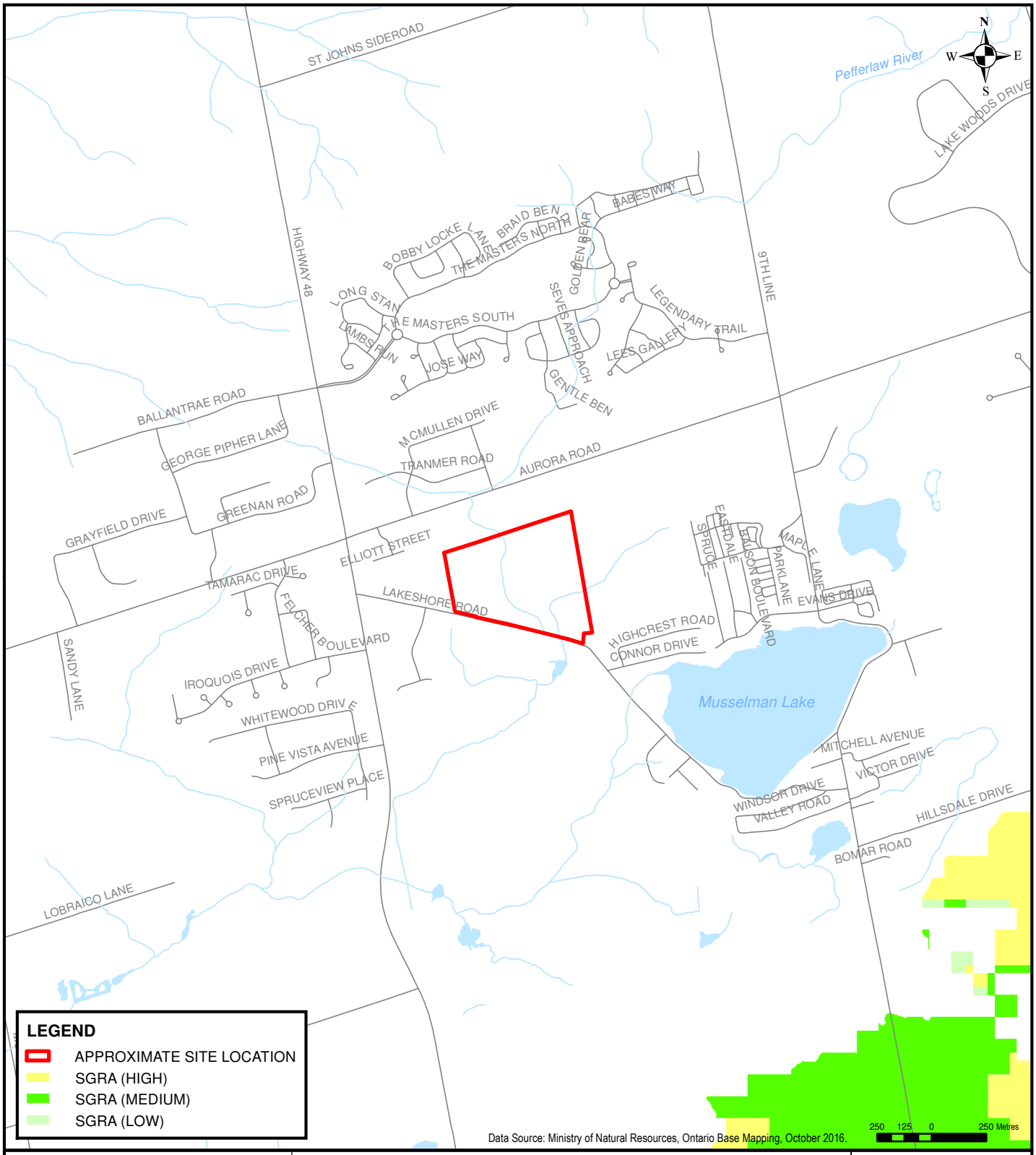


wsp

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY 5426, 5452 & 5584 LAKESHORE ROAD BALLANTRAE, ONTARIO	SCALE: 1:25,000
	DRAWN BY: TP / CHECKED BY: LL
TITLE: WELLHEAD PROTECTION AREAS	PROJECT NO: 161-06960-01
	DATE: APRIL 2021
CLIENT: FAR SIGHT HOMES	FIGURE NO: 13 / REV.: -

Document Path: D:\a\Projects\161-06960-01\2020\MXD\161-06960-01 Figure 13 WHPA.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

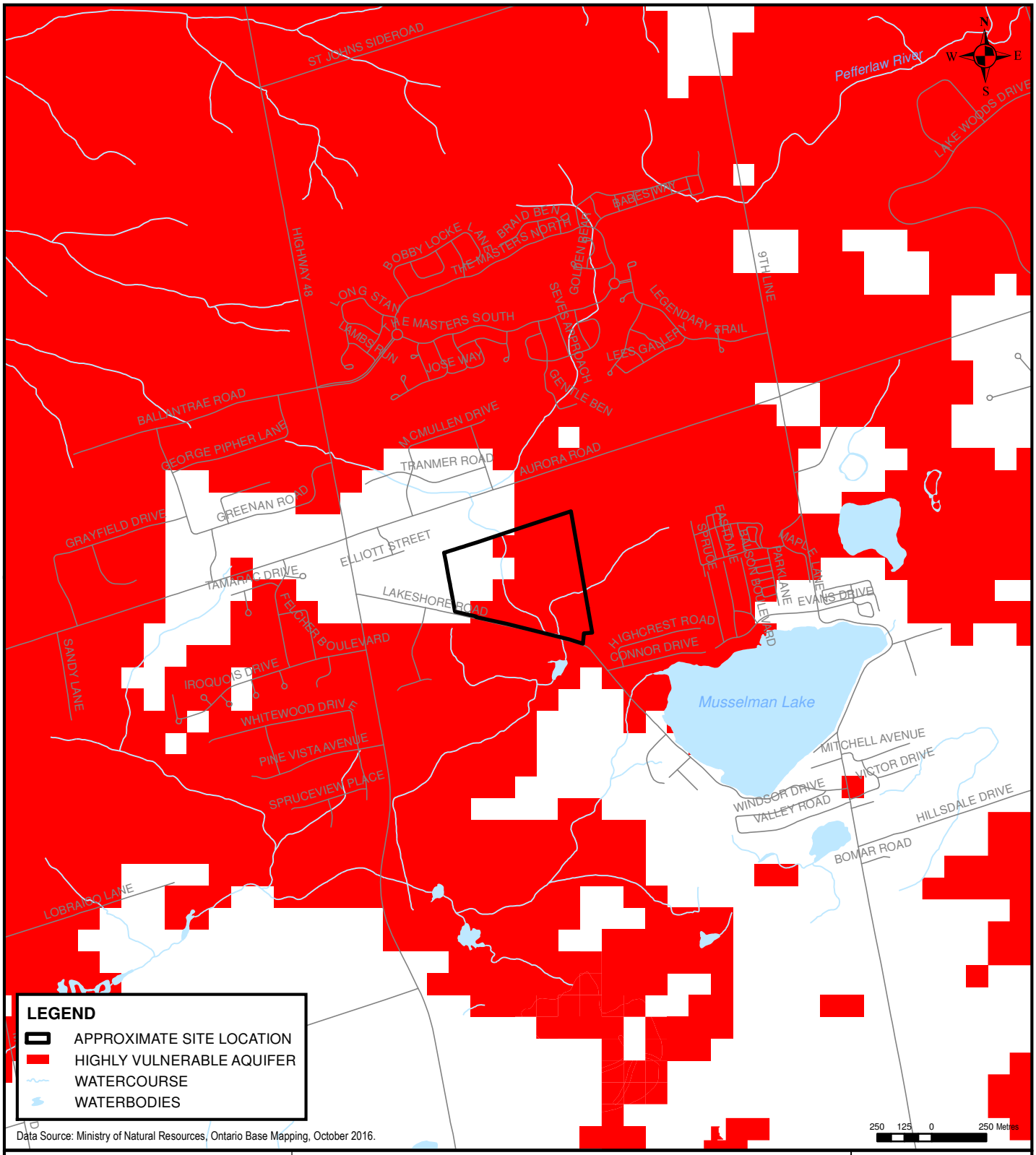
PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

TITLE: SIGNIFICANT GROUNDWATER RECHARGE AREAS

CLIENT: FAR SIGHT HOMES

SCALE:	1:25,000
DRAWN BY:	TP
CHECKED BY:	LL
PROJECT NO:	161-06960-01
DATE:	APRIL 2021
FIGURE NO:	14
REV.:	-

Document Path: D:\a\Projects\161-06960-01\2020\MXD\161-06960-01 Figure 14 SGRA.mxd



Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

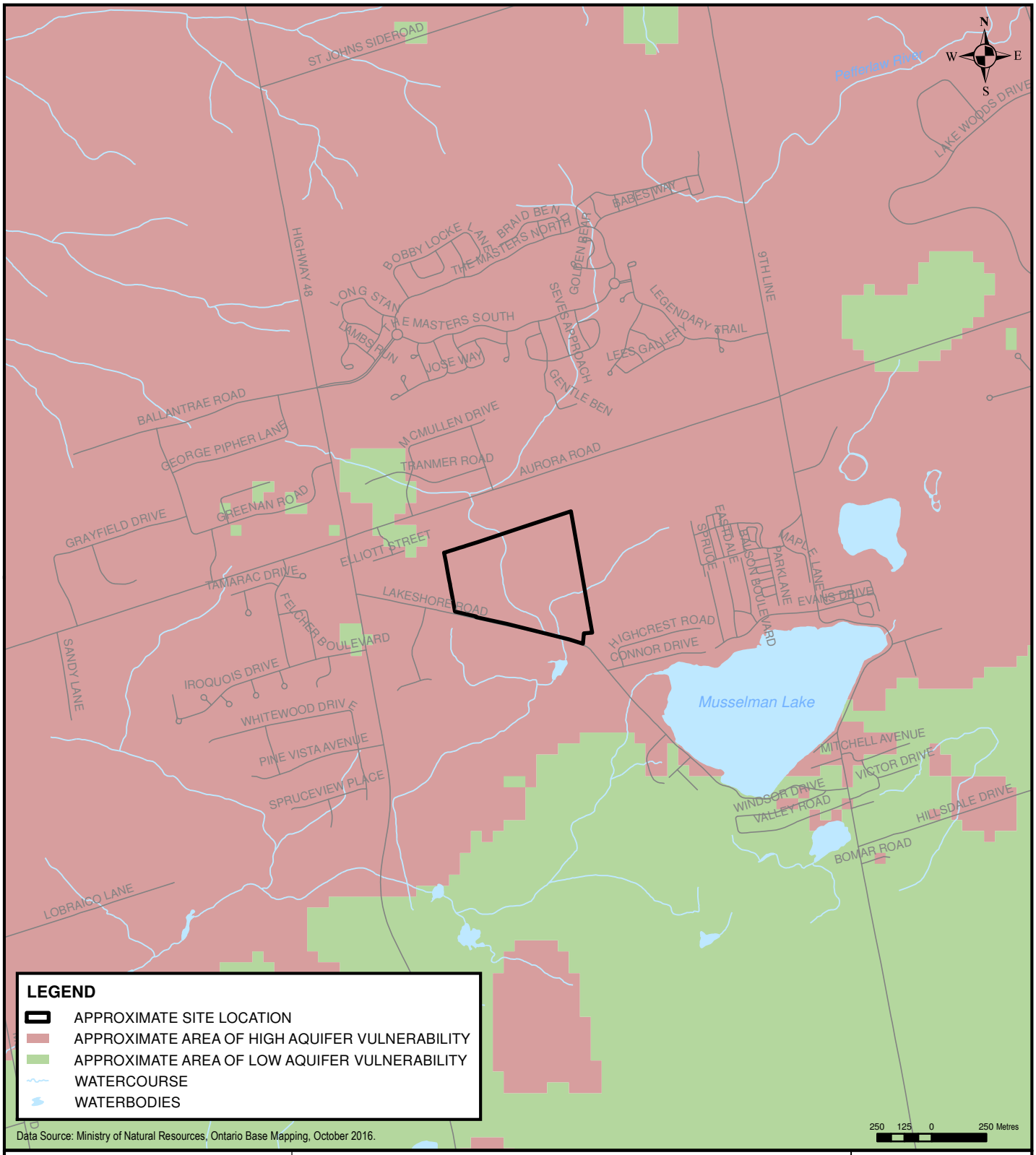
PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

TITLE: HIGHLY VULNERABLE AQUIFERS

CLIENT: FAR SIGHT HOMES

SCALE:	1:25,000
DRAWN BY:	TP
CHECKED BY:	LL
PROJECT NO:	161-06960-01
DATE:	APRIL 2021
FIGURE NO:	15
REV.:	-

Document Path: D:\a\Projects\161-06960-01\2020\MXD\161-06960-01 Figure 15 HVA.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

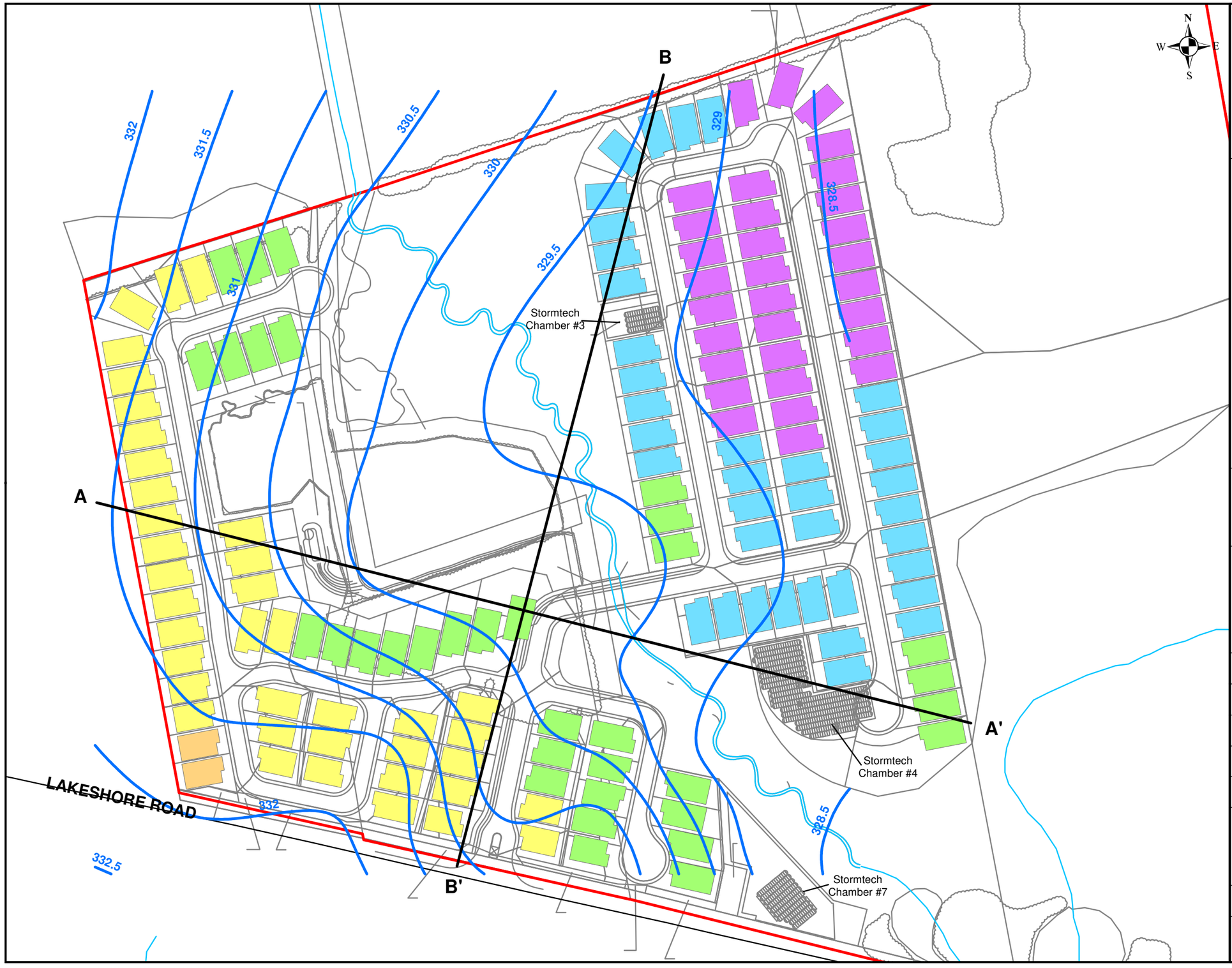
PROJECT: HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

TITLE: OAK RIDGES MORAINE AQUIFER VULNERABILITY

CLIENT: FAR SIGHT HOMES

SCALE:	1:25,000
DRAWN BY:	TP
CHECKED BY:	LL
PROJECT NO:	161-06960-01
DATE:	APRIL 2021
FIGURE NO:	16
REV.:	-

Document Path: D:\a\Projects\161-06960-01\2020\MXD\161-06960-01 Figure 16 ORM Vulnerability.mxd



wsp

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- APPROXIMATE SITE BOUNDARY
- PROPOSED DEVELOPMENT
- GROUNDWATER CONTOURS
- CROSS SECTION LOCATION
- CREEK REALIGNMENT
- USF: 0 - 1 m ABOVE GROUNDWATER
- USF: 1 - 2 m ABOVE GROUNDWATER
- USF: 2 - 3 m ABOVE GROUNDWATER
- USF: 3 - 4 m ABOVE GROUNDWATER
- USF: 4 - 5 m ABOVE GROUNDWATER

20 10 0 20 Metres

CLIENT:

FAR SIGHT HOMES

PROJECT:

HYDROGEOLOGICAL ASSESSMENT AND
WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

PROJECT NO:	DATE:
161-06960-01	APRIL 2021

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: LL

FIGURE NO:	SCALE:
17	1:2,000

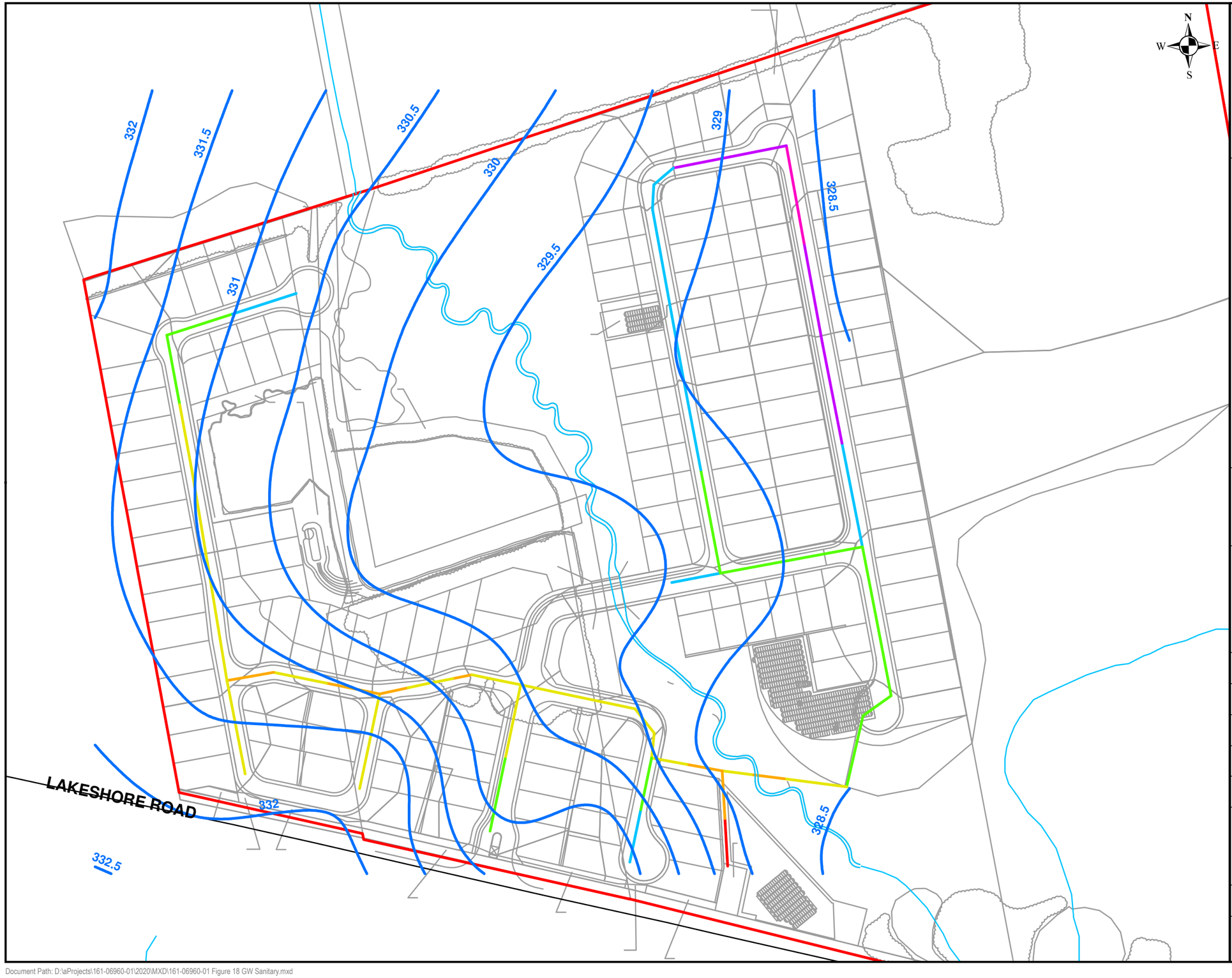
TITLE:

BUILDING FOOTPRINTS
ABOVE AND BELOW
GROUNDWATER ELEVATIONS

DISCIPLINE: ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 17 GW Building Footprints.mxd



wsp

126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- APPROXIMATE SITE BOUNDARY
- PROPOSED DEVELOPMENT
- GROUNDWATER CONTOURS
- CREEK REALIGNMENT
- PIPES > 2 m BELOW GROUNDWATER
- PIPES 1 - 2 m BELOW GROUNDWATER
- PIPES 0 - 1 m BELOW GROUNDWATER
- PIPES 0 - 1 m ABOVE GROUNDWATER
- PIPES 1 - 2 m ABOVE GROUNDWATER
- PIPES 2 - 3 m ABOVE GROUNDWATER
- PIPES > 3 m ABOVE GROUNDWATER

20 10 0 20 Metres

CLIENT:
FAR SIGHT HOMES

PROJECT:
HYDROGEOLOGICAL ASSESSMENT AND
WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

PROJECT NO:	DATE:
161-06960-01	APRIL 2021

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: LL

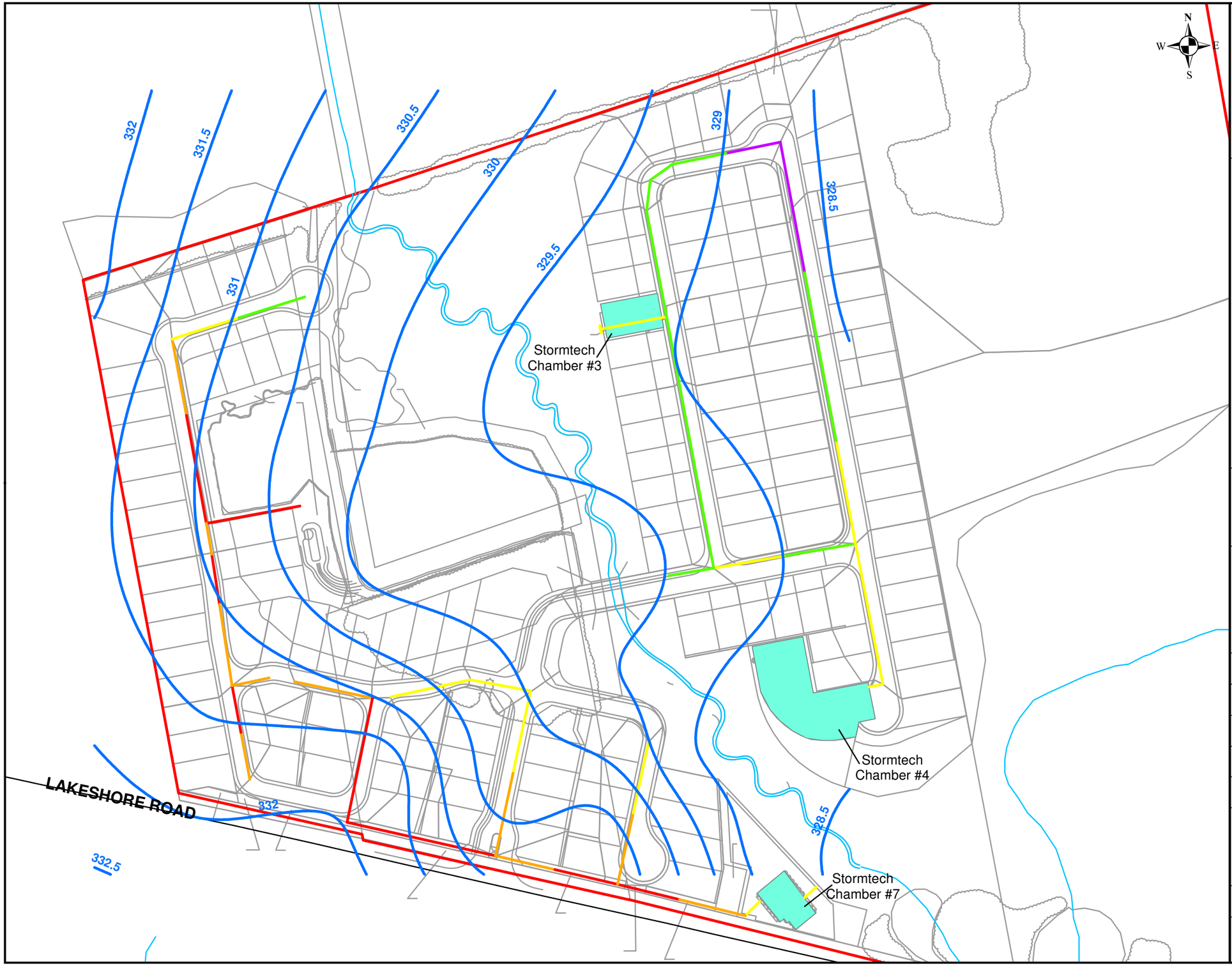
FIGURE NO:	SCALE:
18	1:2,000

TITLE:
SANITARY PIPES
ABOVE AND BELOW
GROUNDWATER ELEVATIONS

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 18 GW Sanitary.mxd



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- APPROXIMATE SITE BOUNDARY
- PROPOSED DEVELOPMENT
- GROUNDWATER CONTOURS
- CREEK REALIGNMENT
- PIPES 0 - 1 m BELOW GROUNDWATER
- PIPES 0 - 1 m ABOVE GROUNDWATER
- PIPES 1 - 2 m ABOVE GROUNDWATER
- PIPES 2 - 3 m ABOVE GROUNDWATER
- PIPES > 3 m ABOVE GROUNDWATER

STORMTECH LID STRUCTURE

- >1 m ABOVE GROUNDWATER

20 10 0 20 Metres

CLIENT:

FAR SIGHT HOMES

PROJECT:

HYDROGEOLOGICAL ASSESSMENT AND
WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

PROJECT NO:	DATE:
161-06960-01	APRIL 2021

DESIGNED BY: -

DRAWN BY: T.P.

CHECKED BY: LL

FIGURE NO:	SCALE:
19	1:2,000

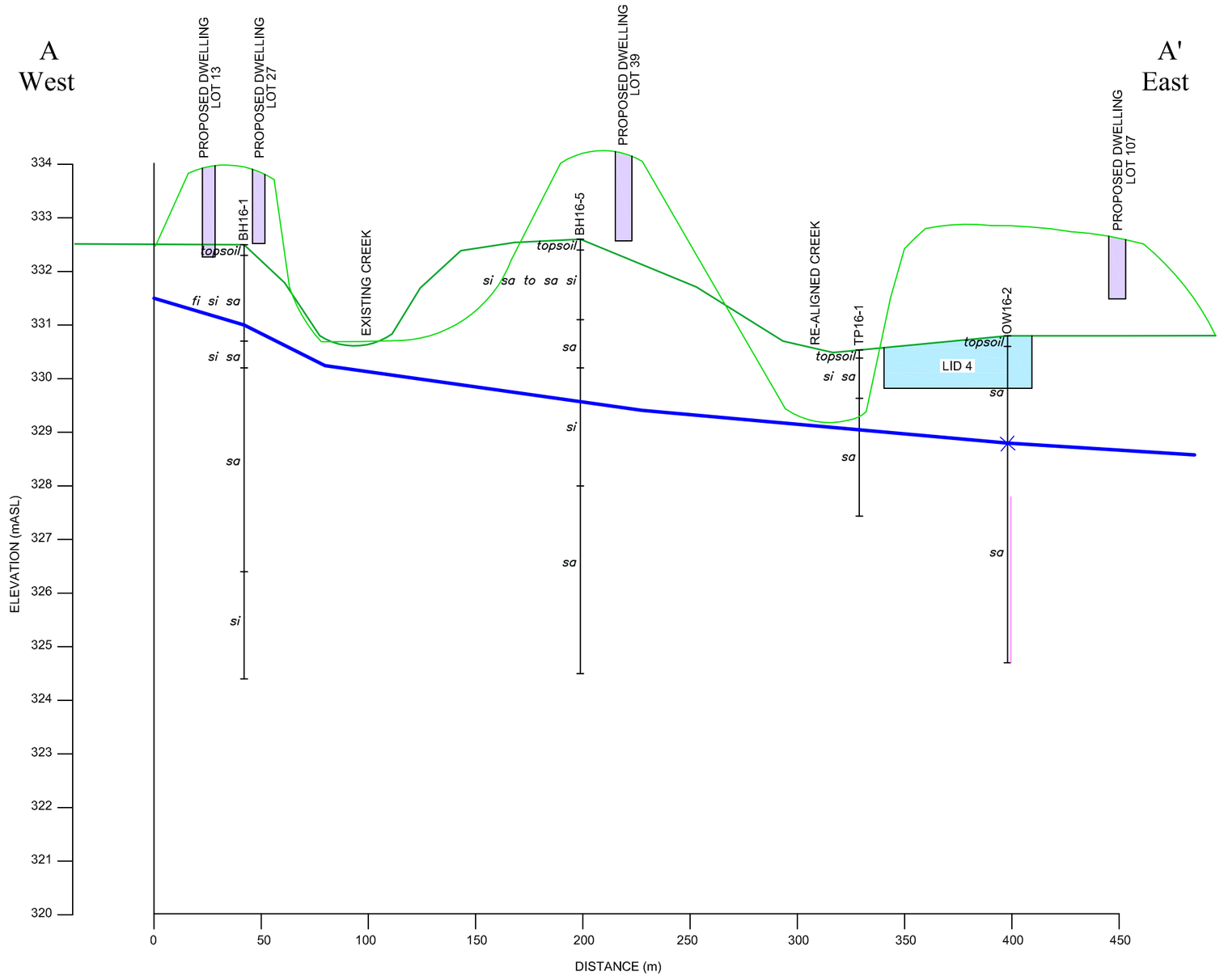
TITLE:

STORM WATER PIPES &
STORMTECH LID STRUCTURES
ABOVE AND BELOW
GROUNDWATER ELEVATIONS

DISCIPLINE: ENVIRONMENT

ISSUE:	REV.:
-	-

Document Path: D:\aProjects\161-06960-01\2020\MXD\161-06960-01 Figure 19 GW Storm Sewer.mxd



LEGEND

BH16-1 — WELL ID

GROUND SURFACE

WATER LEVEL / WELL SCREEN

CHANGE IN STRATIGRAPHY

END OF BORING (mBGL)

INTERPOLATED GROUNDWATER ELEVATION

PROPOSED GROUND SURFACE (APPROXIMATE)

SOIL DESCRIPTION:

gr fi - GRANULAR FILL
fi - FILL
si - SILT
sa - SAND
si cl - SILTY CLAY
si cl ti - SILTY CLAY TILL
sa si cl ti - SAND SILTY CLAY TILL

NOTE:
THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE WELL LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SHOWN BETWEEN BORINGS. WELL DATA IS PROJECTED ONTO THE SECTION WHICH ALSO MAY CREATE SOME IRREGULARITIES IN CONTACT DEPTHS.

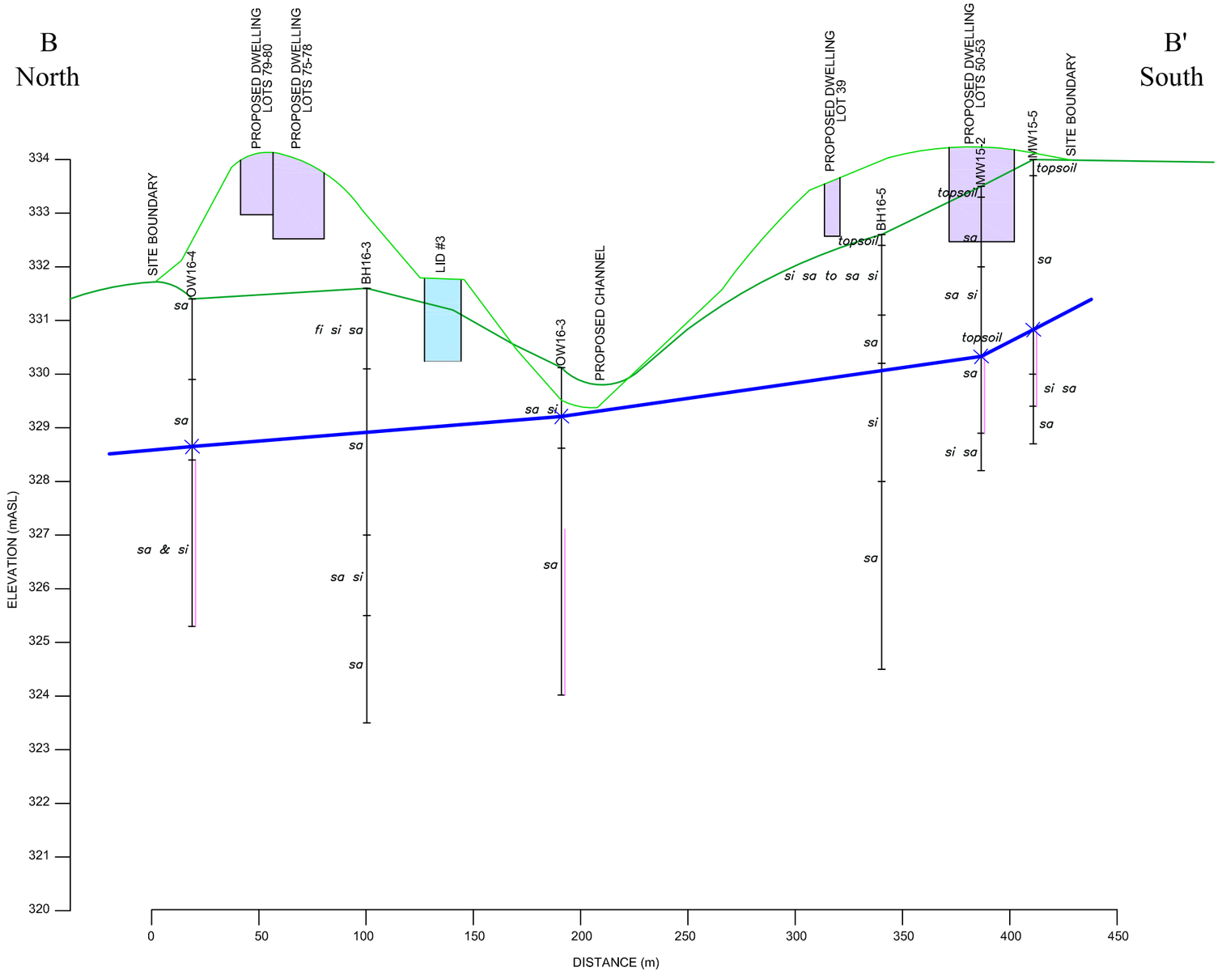
CROSS SECTION A-A'

HYDROGEOLOGICAL ASSESSMENT AND
WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

DATE: APRIL 2021	SCALES: AS SHOWN
PROJECT: 161-06960-01	FILE NO.: 161-06960-01 F20 CR

wsp

FIGURE 20



LEGEND

BH16-1 — WELL ID

GROUND SURFACE

WATER LEVEL / WELL SCREEN

CHANGE IN STRATIGRAPHY

END OF BORING (mBGL)

INTERPOLATED GROUNDWATER ELEVATION

PROPOSED GROUND SURFACE (APPROXIMATE)

NOTE:
THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE WELL LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SHOWN BETWEEN BORINGS. WELL DATA IS PROJECTED ONTO THE SECTION WHICH ALSO MAY CREATE SOME IRREGULARITIES IN CONTACT DEPTHS.

CROSS SECTION B-B'

HYDROGEOLOGICAL ASSESSMENT AND
WATER BALANCE STUDY
5426, 5452 & 5584 LAKESHORE ROAD
BALLANTRAE, ONTARIO

DATE: APRIL 2021	SCALES: AS SHOWN
PROJECT: 161-06960-01	FILE NO.: 161-06960-01 F21 CR

wsp

FIGURE 21

APPENDIX

A STORMWATER MANAGEMENT PLAN

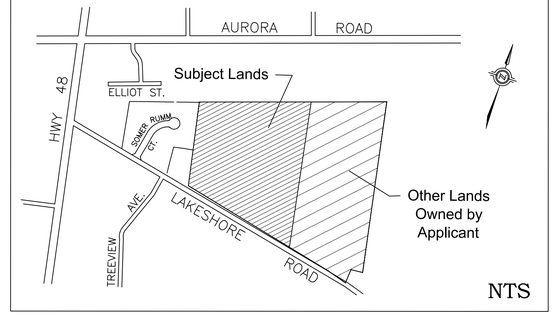
ADDITIONAL INFORMATION

Required Under Section 51 of the Planning Act R.S.O. 1990

a) shown on draft plan
b) shown on draft plan
c) shown on key map
d) shown on schedule of land use
e) shown on draft plan
f) shown on draft plan
g) shown on draft plan
h) municipal water service
i) sand, silty sand
j) shown on draft plan
k) connection to existing WWTP
l) none

Note: Contours relate to Canadian Geodetic Datum

KEY PLAN



SCHEDULE OF LAND USE

Lots 1-140 - Condominium Single Detached Residential	7.51 ha	45 %
Blocks 141-143 - Storm Water Management (SWM)	0.59 ha	3 %
Blocks 144-145, 161 - Open Space Conservation	3.85 ha	24 %
Blocks 146-149 - Open Space	0.09 ha	1 %
Blocks 150-151 - Emergency Access	0.02 ha	1 %
Block 152 - Access Link	0.05 ha	1 %
Block 153 - Pumping Station	0.03 ha	1 %
Block 154 - Private Roads (11.0m)	2.23 ha	13 %
Block 155 - Road Widening	0.23 ha	1 %
Block 156 - Woodland & Wetland Protection Area	1.10 ha	7 %
Block 157 - Woodland & Wetland 10m Buffer	0.28 ha	1 %
Blocks 158-159 - Woodland Buffer	0.41 ha	3 %
TOTAL	16.32 ha	100.0%

OWNER'S AUTHORIZATION

We, hereby, authorize Alcorn & Associates Limited to prepare and submit this Revised Draft Plan of Subdivision 19T(W)14.003 to the Town of Whitchurch-Stouffville.

Original Signed — Dec 20, 2018
2506339 Ontario Inc. — Date

Original Signed — Dec 20, 2018
Richard Schickedanz — Date

SURVEYOR'S CERTIFICATE

We, hereby, certify that the boundaries of the lands to be subdivided and their relationship to adjacent lands are accurately drawn and correctly shown.

Original Signed — Nov 13, 2018
Greg Robinson, O.L.S. — Date
JD Barnes Limited

Draft Plan of Subdivision

PART OF LOTS 19 & 20, CONCESSION 8
TOWN OF WHITCHURCH - STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

Farsight Homes
5426, 5452 and 5584 Lakeshore Road, Ballantrae

SCALE 1:1500

ALCORN & ASSOCIATES LIMITED
Land Planning and Development Consultants

12 Greenvalley Circle,
Stouffville, Ontario L4A 2L4

Tel: (905) 940-0931

January 29, 2021

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

CHANNEL DESIGN PREPARED BY GEO MORPHIX REFER TO DRAWINGS GEO-1, GEO-2, DET-1

EXISTING WOODLAND

EXISTING WETLAND

DRY POND MEADOW

EMERGENCY OVERLAND FLOW ROUTE

STREET A

STREET B

STREET C

STREET D

STREET E

LAKESHORE ROAD

BLOCK 144 SWM

BLOCK 143 SWM

BLOCK 145

BLOCK 147 OPEN SPACE CONSERVATION

BLOCK 148 OPEN SPACE CONSERVATION

BLOCK 155 EMERGENCY ACCESS

BLOCK 156 PUMPING STATION

BLOCK 154 EMERGENCY ACCESS

BLOCK 152 SWM POND

BLOCK 157 SWM POND

BLOCK 158 SWM POND

GW - 328.5

GW - 329

GW - 329.5

GW - 330

GW - 330.5

GW - 331.5

GW - 332

GW - 337

WALKWAY GRADING DETAIL

SCALE 1:250

LEGEND:

- PROPOSED CHANNEL REALIGNMENT
- 334.84 PROPOSED GRADE
- PROPOSED SLOPE 3:1 SLOPE (MAX)
- PROPOSED OVERLAND FLOW DIRECTION
- PROPOSED SWALE
- 333 ORIGINAL GROUND CONTOUR
- 329.00 PROPOSED GROUND CONTOUR
- LOT MAY REQUIRE SUMP PUMP SYSTEM TO STORM SEWERS
- SD SPLIT DRAINING LOT
- FD FRONT DRAINING LOT
- WO WALKOUT BASEMENT
- 227.34 PRELIMINARY UNDERSIDE OF FOOTING

SCALE 1:750

FARSIGHT HOMES
PRELIMINARY GRADING

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	3

191(W)-19.001

PLOT DATE: 4/26/2020 1:38 PM CAD FILE: P:\13\286\Drawing Files\Phase 1\Figure\103_ Rev 5 50% Submission - Sept 2020\286_Fig 03 Prelim Grading.dwg

EAST LIMIT OF SUBDIVISION

NORTH LIMIT OF SUBDIVISION

WEST LIMIT OF SUBDIVISION

LIMIT OF 3.0m BUFFER

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

LAKESHORE ROAD

EXISTING WETLAND

EXISTING WOODLAND

LID 3
STORMTECH
GROUNDWATER ELEV: 329.21
GRANULAR INVERT: 329.77
CELL INVERT: 331.09
GROUND SURFACE: 333.16

LID 4
STORMTECH
GROUNDWATER ELEV: 328.79
GRANULAR INVERT: 329.79
CELL INVERT: 330.12
GROUND SURFACE: 332.26

LID 7
STORMTECH
GROUNDWATER ELEV: 328.68
GRANULAR INVERT: 329.68
CELL INVERT: 329.06
GROUND SURFACE: 332.08

BLOCK 151 CROSS SECTION
N.T.S.

LEGEND:

- 0.30 / 0.20 / 12.67 - AREA IN ha / RUNOFF COEFFICENT / TIME OF CONCENTRATION
- 0.75 / 0.60 - AREA IN ha / RUNOFF COEFFICENT
- OVERLAND FLOW ROUTE ARROW
- PROPOSED STORM SEWER SIZED FOR 100YR
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- PROPOSED STORM DRAINAGE AREA
- PROPOSED CHANNEL REALIGNMENT
- LOT MAY REQUIRE SUMP PUMP SYSTEM TO STORM SEWERS
- PROPOSED FLOODLINE
- EXISTING FLOODLINE

SCALE 1:750

FARSIGHT
PROPOSED STORM SERVICING

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	5

19T(W)-19.001

PLOT DATE: 4/28/2020, 1:42 PM, CAD FILE: P:\13\286\Drawing Files\Plans (Figures)\02 - 2nd FSSR Submission - Sept 2020\286 Fig 05 Prelim Storm Servicing.dwg

EAST LIMIT OF SUBDIVISION

NORTH LIMIT OF SUBDIVISION

WEST LIMIT OF SUBDIVISION

BLOCK 148 OPEN SPACE CONSERVATION

BLOCK 165 OPEN SPACE 15.0m ROADWAY ACCESS

STREET E

STREET D

STREET A

STREET B

STREET C

STREET D

LAKESHORE ROAD

105.0 - 200ø SAN @ 1.0%

109.0 - 200ø SAN @ 0.5%

85.7 - 200ø SAN @ 0.5%

81.5 - 200ø SAN @ 1.0%

176.0 - 200ø SAN @ 0.50%

85.0 - 200ø SAN @ 0.5%

110.0 - 200ø SAN @ 0.5%

13.0 - 200ø SAN @ 0.5%

14.1 - 200ø SAN @ 0.5%

86.0 - 200ø SAN @ 1.0%

MH 1A
TOP 335.45
W 333.70
S 332.20

MH 2A
TOP 334.86
E 331.10
SW 330.93

MH 3A
TOP 334.78
NE 330.98
SW 330.93

MH 4A
TOP 334.65
NE 330.87
S 330.82

MH 5A
TOP 334.61
N 330.40
S 330.38

MH 6A
TOP 334.33
E 331.13

MH 7A
TOP 334.19
W 330.87
W DROP 329.83
N 329.83
E 329.75

MH 8A
TOP 334.68
N 331.15
S 331.13

MH 9A
TOP 333.92
N 330.55
N DROP 329.32
W 329.37
S 329.29

MH 10A
TOP 333.55
N 328.86
SW 328.81

MH 11A
TOP 333.25
NE 328.73
SW 328.65

MH 12A
TOP 330.66
NE 328.48
NW 328.40
NW DROP 327.28

MH 105A
TOP 335.22
W 332.16

MH 106A
TOP 334.78
E 330.31
S 331.23

MH 107A
TOP 334.35
N 330.86
S 330.84

MH 108A
TOP 334.71
N 330.79

MH 109A
TOP 334.67
S 331.01
S DROP 330.29
N 330.29
E 330.21

MH 110A
TOP 334.59
W 330.08
E 330.03

MH 111A
TOP 334.43
N 331.23

MH 112A
TOP 335.00
S 330.72
S DROP 329.76
W 329.76
E 329.71

MH 113A
TOP 334.80
SW 329.56
NE 329.51

MH 114A
TOP 334.61
SW 329.41
E 329.56

MH 115A
TOP 334.34
N 329.97
W 329.27
S 329.97
S DROP 329.22
E 329.21

MH 116A
TOP 334.64
W 329.08
SE 329.03

MH 117A
TOP 334.79
NW 328.97
S 328.92

MH 118A
TOP 334.65
S 330.52
S DROP 328.58
N 328.84
E 328.76

MH 119A
TOP 334.23
NW 331.05

MH 120A
TOP 332.11
W 328.57
W DROP 327.16
E 327.16
S 327.08

MH 104A
TOP 333.95
N 330.75

PSMH
TOP 332.09
N 326.83

16.0 - 200ø SAN @ 0.5%

36.0 - 200ø SAN @ 0.5%

56.0 - 200ø SAN @ 1.0%

50.0 - 200ø SAN @ 0.5%

37.0 - 200ø SAN @ 1.0%

51.0 - 200ø SAN @ 1.0%

77.0 - 200ø SAN @ 1.0%

30.0 - 200ø SAN @ 0.5%

51.0 - 200ø SAN @ 1.0%

74.0 - 200ø SAN @ 0.5%

110.0 - 200ø SAN @ 0.5%

65.5 - 200ø SAN @ 0.5%

50.0 - 200ø SAN @ 1.0%

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

CROSSING DATA
STREAM ELEV 328.75
SAN TOP 327.25
CLEARANCE 1.50m

PROPOSED LOCATION OF LOCAL SANITARY PUMPING STATION

EXISTING DRAINAGE EASEMENT

EXISTING WOODLAND

BLOCK 159 PROVINCIALLY SIGNIFICANT WETLAND PROTECTION AREA

BLOCK 160 Wetland Buffer

BLOCK 161 Wetland Buffer

BLOCK 162 Wetland Buffer

BLOCK 144 SWM

BLOCK 145 SWM

BLOCK 156

BLOCK 143 SWM

BLOCK 147 OPEN SPACE CONSERVATION

BLOCK 152 OPEN SPACE

BLOCK 154 5m WALKWAY ACCESS

BLOCK 158 Wetland Buffer

BLOCK 150 OPEN SPACE

BLOCK 153 5m WALKWAY ACCESS

BLOCK 149 OPEN SPACE

LEGEND:

- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- FM — PROPOSED SANITARY FORCEMAIN

SCALE 1:750

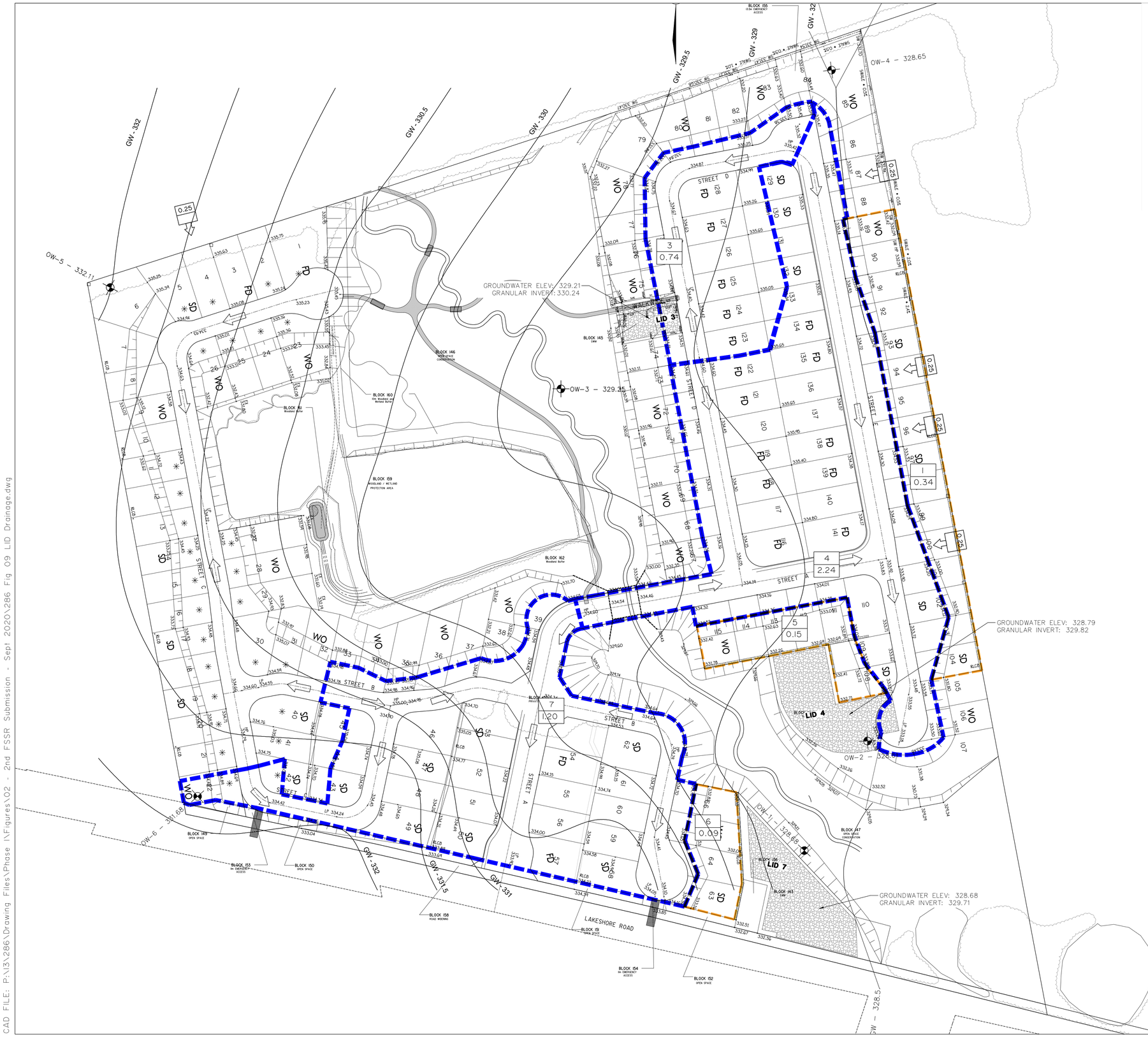
FARSIGHT HOMES
PROPOSED SANITARY SERVICING

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	6

191(W)-19.001

PLOT DATE: 4/26/2020 1:46 PM CAD FILE: P:\13-286\Drawing Files\Plans in Figure\103 - Rev 5\SA Submission - Sept 2020\286 Fig 06-07 Prelim Sanitary Servicing.dwg



LEGEND

- 5 / 0.17 — LID IDENTIFICATION NUMBER / IMPERVIOUS AREA (HA)
- LID DRAINAGE BOUNDARY
- GROUNDWATER ELEVATION OBSERVATION WELL
- LID FOOTPRINT
- SEASONALLY HIGH GROUNDWATER CONTOUR PROVIDED BY WSP

1:2000

LID DRAINAGE

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	9

CAD FILE: P:\13\286\Drawing Files\Phase IV\Figures\02 - 2nd FSSR Submission - Sept 2020\286 Fig 09 LID Drainage.dwg

13:286
Ballantrae Lands
LID Sizing

LID	Type	Drainage Area m^2	Impervious Area m^2	% Impervious	25mm Equivalent Volume m^3	Infiltration Rate mm/hr	Trench Depth m	Width m	Length m	Contact Area m^2	Storage Volume m^3	Equivalent Runoff Depth Provided mm
LID 1	Bioswale	5,071	3,427	68%	86	40	0.74	1	240	239.9	**71**	**21**
LID 3	StormTech	7,382	6,076	82%	152	40	0.98	18	30	545	**214**	**35**
LID 4	StormTech	22,406	18,472	82%	462	40	0.33	20	97	1940	**256**	**14**
LID 5	Bioswale	2,275	1,499	66%	37	40	0.96	1	101	100.7	**39**	**26**
LID 6	Bioswale	1,592	857	54%	21	16	0.38	1	66	65.7	**10**	**12**
LID 7	StormTech	19,210	11,911	62%	298	16	0.38	50	39	1944	**295**	**25**
		Total	**42,242**							**Total**	**885**	

APPENDIX

B MECP WATER WELL RECORDS

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
1907350	637530.6	4877209	334.978942	55.1688	7.01	22.73045	Water Supply	Domestic+	0.00	2.44	BROWN	SAND	CLAY	
									2.44	11.58	BROWN	CLAY	SOFT	
									11.58	17.07	BROWN	SILT	WATER-BEARING	
									17.07	27.43	GREY	SILT	WATER-BEARING	
									27.43	40.54	GREY	CLAY	SILT	WATER-BEARING
									40.54	50.90	GREY	SILT	GRAVEL	WATER-BEARING
									50.90	53.34	GREY	SAND	GRAVEL	WATER-BEARING
									53.34	55.17	BROWN	SAND	GRAVEL	WATER-BEARING
6908306	637531.6	4877004	334.796844	22.86	2.7432	13.63827	Water Supply	Domestic	0.00	0.91		FINE SAND		
									0.91	3.05	GREY	CLAY		
									3.05	20.73		FINE SAND		
									20.73	22.86		MEDIUM SAND		
6908307	637619.6	4876933	336.035339	16.1544	13.41120	22.73045	Water Supply	Domestic	0.00	16.15		FINE SAND		
6908308	637412.6	4877084	328.987609	22.2504	3.6576	18.18436	Water Supply	Domestic	0.00	0.30		TOPSOIL		
									0.30	3.66		CLAY		
									3.66	18.59		MEDIUM SAND		
									18.59	22.25		MEDIUM SAND		
6908313	636584.6	4877211	337.095886	19.5072	12.192	18.18436	Water Supply	Domestic	0.00	6.10		PREVIOUSLY DUG		
									6.10	12.19	BROWN	CLAY		
									12.19	19.51		FINE SAND		
6908316	637579.6	4876977	336.360473	15.24	11.5824	18.18436	Water Supply	Domestic	0.00	15.24		MEDIUM SAND		
6908318	636911.6	4877124	333.458984	14.3256	10.9728	13.63827	Water Supply	Domestic	0.00	14.33		COARSE SAND		
6908320	636815.6	4877224	334.129791	41.148	9.144	9.09218	Water Supply	Domestic	0.00	4.88		PREVIOUSLY DUG		
									4.88	12.19		CLAY	FINE SAND	
									12.19	18.29		FINE SAND		
									18.29	27.43	BLUE	CLAY		
									27.43	35.05		CLAY	MEDIUM SAND	
									35.05	41.15	BLUE	FINE SAND		
6908321	636807.6	4877556	334.979339	17.3736	7.62	0	Water Supply	Domestic	0.00	7.62		PREVIOUSLY DUG		
									7.62	14.33	YELLOW	CLAY	SILT	
									14.33	17.37	RED	FINE SAND		
									0.00	7.32		PREVIOUSLY DUG		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6908322	636658.6	4877286	335.528747	70.104	2.7432	22.73045	Test Hole	Not Used	7.32	19.81	BROWN	MEDIUM SAND	SILT	
									19.81	70.10		QUICKSAND	CLAY	
6910269	636924.6	4877623	331.815948	9.144	6.096	22.73045	Water Supply	Domestic	0.00	0.30	BLACK	TOPSOIL	MEDIUM SAND	
									0.30	9.14	RED	MEDIUM SAND		
6910343	637004.6	4877663	330.422821	24.6888	6.096	22.73045	Water Supply	Domestic	0.00	7.62	BROWN	MEDIUM SAND	CLAY	
									7.62	21.64	BLUE	SILT	CLAY	
									21.64	24.69	GREY	FINE SAND		
6910344	636964.6	4877653	331.290435	25.2984	6.4008	27.27654	Water Supply	Domestic	0.00	7.62	BROWN	MEDIUM SAND	CLAY	
									7.62	22.25	BLUE	SILT	CLAY	
									22.25	25.30	GREY	FINE SAND		
6910345	636929.6	4877633	331.653472	24.384	6.096	36.36872	Water Supply	Domestic	0.00	10.97	BROWN	MEDIUM SAND	CLAY	
									10.97	21.64	BLUE	SILT	CLAY	
									21.64	24.38	GREY	FINE SAND		
6910538	636904.6	4877623	332.273437	26.5176	6.4008	27.27654	Water Supply	Domestic	0.00	4.88	BROWN	MEDIUM SAND		
									4.88	5.79	BROWN	CLAY		
									5.79	15.85	BROWN	MEDIUM SAND		
									15.85	16.46	GREY	MEDIUM SAND		
									16.46	19.51	GREY	CLAY	GRAVEL	
									19.51	20.12	GREY	MEDIUM SAND		
									20.12	21.03	GREY	CLAY		
									21.03	23.16	GREY	MEDIUM SAND		
									23.16	24.69	GREY	SILT		
									24.69	26.52	BROWN	MEDIUM SAND		
6910730	636864.6	4877563	333.999969	25.908	6.7056	9.09218	Water Supply	Domestic	0.00	1.22	BROWN	MEDIUM SAND		
									1.22	3.05	BROWN	MEDIUM SAND	CLAY	
									3.05	8.53	BROWN	CLAY	GRAVEL	
									8.53	14.94	BROWN	FINE SAND		
									14.94	17.37	GREY	MEDIUM SAND	CLAY	
									17.37	21.03	GREY	CLAY		
									21.03	24.38	GREY	SILT		
									24.38	25.91	BROWN	MEDIUM SAND		
6910818	636814.6	4877483	335.244171	10.668	6.096	22.73045	Water Supply	Domestic	0.00	0.30		TOPSOIL	MEDIUM SAND	
									0.30	6.71	BROWN	FINE SAND	CLAY	
									6.71	10.67	BROWN	MEDIUM SAND		
6911078	636604.6	4876953	335.685699	32.9184	6.096	45.4609	Water Supply	Domestic	0.00	6.10	BROWN	SAND		
									6.10	10.97	BROWN	CLAY		
									10.97	29.87	GREY	CLAY	SILT	
									29.87	32.92	GREY	SAND		
6912956	637072.6	4877111	335.056365	22.86	15.24	36.36872	Water Supply	Domestic	0.00	5.18		PREVIOUSLY DUG		
									5.18	13.72	BROWN	FINE SAND		
									13.72	19.81	BROWN	CLAY	SAND	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
									19.81	22.86	BROWN	FINE SAND		
6913612	636554.6	4877323	336.25476	33.528	4.8768	18.18436	Water Supply	Domestic	0.00	3.66	BROWN	CLAY		
									3.66	6.71	BROWN	COARSE SAND		
									6.71	24.38	BROWN	CLAY	SAND	
									24.38	32.61	BLUE	CLAY		
									32.61	33.53	GREY	FINE SAND		
6913839	636784.6	4877573	335.005065	12.192	11.5824	22.73045	Water Supply	Domestic	0.00	0.61		TOPSOIL		
									0.61	5.49	BROWN	CLAY	SANDY	
									5.49	6.10		SAND		
									6.10	12.19	BROWN	CLAY	SANDY	
6913958	637514.6	4876823	334.196075	15.8496	11.5824	27.27654	Water Supply	Domestic	0.00	0.61	BLACK	TOPSOIL		
									0.61	9.14	BROWN	CLAY	STONES	
									9.14	12.19	BLUE	CLAY		
									12.19	15.85	BROWN	SAND		
6914298	636664.6	4877473	336.559387	31.3944	12.192	22.73045	Water Supply	Domestic	0.00	3.96	BROWN	SAND		
									3.96	8.53	YELLOW	CLAY		
									8.53	19.81	BROWN	SILT	CLAY	
									19.81	26.21	GREY	CLAY		
									26.21	28.04	GREY	SILT		
									28.04	29.57	GREY	CLAY		
									29.57	31.39	BROWN	SAND	WATER-BEARING	
6914300	636714.6	4877473	336.552886	33.528	11.5824	22.73045	Water Supply	Domestic	0.00	3.96	BROWN	SAND		
									3.96	9.14	YELLOW	CLAY		
									9.14	20.42	BROWN	SILT	CLAY	
									20.42	27.43	GREY	CLAY		
									27.43	29.26	GREY	SILT		
									29.26	32.00	GREY	CLAY		
									32.00	33.53	BROWN	SAND	WATER-BEARING	
6914301	636664.6	4877523	337.079132	32.3088	12.4968	40.91481	Water Supply	Domestic	0.00	3.66	BROWN	SAND		
									3.66	8.23	YELLOW	CLAY	SAND	
									8.23	20.73	BROWN	SILT	CLAY	
									20.73	27.43	GREY	CLAY		
									27.43	28.65	GREY	SILT		
									28.65	30.48	GREY	CLAY		
									30.48	32.31	BROWN	SAND	WATER-BEARING	
6914306	636764.6	4877473	335.989959	30.1752	11.8872	31.82263	Water Supply	Domestic	0.00	4.88	BROWN	SAND		
									4.88	10.36	YELLOW	CLAY		
									10.36	20.42	BROWN	SILT	CLAY	
									20.42	28.35	GREY	CLAY		
									28.35	30.18	BROWN	SAND		
									0.00	6.10	BROWN	SAND		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6914307	636564.6	4877373	335.602752	34.1376	12.192	18.18436	Water Supply	Domestic	6.10	9.45	YELLOW	CLAY		
									9.45	19.51	BROWN	SILT	CLAY	
									19.51	27.43	GREY	CLAY		
									27.43	29.26	GREY	SILT		
									29.26	32.61	GREY	CLAY		
									32.61	34.14	BROWN	SAND		
6914555	636614.6	4877373	335.578369	33.528	11.5824	31.82263	Water Supply	Domestic	0.00	5.18	BROWN	SAND		
									5.18	9.75	YELLOW	CLAY	SAND	
									9.75	20.73	BROWN	SILT	CLAY	
									20.73	27.43	GREY	CLAY		
									27.43	29.57	GREY	SILT		
									29.57	31.09	GREY	CLAY		
									31.09	33.53	BROWN	FINE SAND	WATER-BEARING	
6915200	636664.6	4877423	335.774414	33.8328	11.5824	45.4609	Water Supply	Domestic	0.00	5.18	BROWN	SAND		
									5.18	9.45	YELLOW	CLAY		
									9.45	20.73	BROWN	SILT	CLAY	
									20.73	27.74	GREY	CLAY		
									27.74	29.57	GREY	SILT		
									29.57	31.39	GREY	CLAY		
									31.39	33.83	BROWN	FINE SAND	VERY	
6915201	636614.6	4877423	335.848358	34.1376	12.4968	18.18436	Water Supply	Domestic	0.00	4.88	BROWN	SAND		
									4.88	8.84	YELLOW	CLAY		
									8.84	19.81	BROWN	SAND	SILT	CLAY
									19.81	27.43	GREY	CLAY		
									27.43	30.48	GREY	SILT		
									30.48	31.70	GREY	CLAY		
									31.70	34.14	BROWN	SAND		
6915203	636714.6	4877573	336.055572	34.1376	12.8016	36.36872	Water Supply	Domestic	0.00	6.71	BROWN	SAND		
									6.71	9.45	YELLOW	CLAY		
									9.45	21.03	BROWN	SILT	CLAY	
									21.03	32.92	GREY	CLAY		
									32.92	34.14	BROWN	SAND		
6915204	636664.6	4877523	337.079132	35.9664	11.8872	45.4609	Water Supply	Domestic	0.00	7.32	BROWN	SAND		
									7.32	9.75	YELLOW	CLAY	SAND	
									9.75	21.34	BROWN	SILT	CLAY	
									21.34	34.14	GREY	CLAY		
									34.14	35.97	GREY	SAND		
6915207	636814.6	4877473	335.2453	31.3944	11.8872	40.91481	Water Supply	Domestic	0.00	5.49	BROWN	SAND		
									5.49	8.84	YELLOW	CLAY	SAND	
									8.84	20.12	BROWN	SILT	CLAY	
									20.12	29.87	GREY	CLAY		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
									29.87	31.39	BROWN	SAND		
6915208	636814.6	4877423	335.13739	34.1376	12.192	36.36872	Water Supply	Domestic	0.00	6.10	BROWN	SAND		
									6.10	9.14	YELLOW	CLAY	SAND	
									9.14	19.81	BROWN	SILT	CLAY	
									19.81	31.70	GREY	CLAY		
									31.70	34.14	BROWN	SAND		
6915336	636664.6	4877573	336.830963	34.7472	13.1064	45.4609	Water Supply	Domestic	0.00	5.49	BROWN	SAND		
									5.49	9.75	YELLOW	CLAY	SAND	
									9.75	20.73	BROWN	SILT	SAND	CLAY
									20.73	32.92	GREY	CLAY		
									32.92	34.75	BROWN	SAND		
6916128	636664.6	4877423	335.774414	32.6136	12.8016	54.55308	Water Supply	Domestic	0.00	7.92	BROWN	SAND		
									7.92	10.67	YELLOW	CLAY	SAND	
									10.67	20.12	YELLOW	SILT	CLAY	
									20.12	28.65	GREY	CLAY	SILT	
									28.65	31.39	GREY	CLAY		
									31.39	32.61	BROWN	SAND		
6916129	636664.6	4877523	337.079132	33.8328	8.2296	22.73045	Water Supply	Domestic	0.00	6.71	BROWN	SAND		
									6.71	10.36	YELLOW	CLAY	SAND	
									10.36	20.73	YELLOW	SILT	CLAY	
									20.73	24.08	GREY	CLAY		
									24.08	25.60	GREY	SILT		
									25.60	32.92	GREY	CLAY		
									32.92	33.83	BROWN	SAND		
6916979	637514.6	4876973	335.299438	12.8016	6.096	68.19135	Water Supply		0.00	5.49	BROWN	SAND		
									5.49	8.23	BROWN	FINE SAND	CLAY	
									8.23	12.80	BROWN	SAND		
6922280	636792	4877588	334.86264	30.48	7.0104	45.4609	Water Supply	Domestic	0.00	5.18	BROWN	SAND	SILT	
									5.18	7.62	BROWN	CLAY	SOFT	
									7.62	10.06	BROWN	SAND	CLAY	
									10.06	21.34	BROWN	SAND	SILT	
									21.34	27.74	GREY	CLAY	SOFT	
									27.74	30.48	GREY	SAND	FINE SAND	
6922367	636590	4876966	335.838867	-	4.8768	4.54609	Water Supply	Domestic	0.00	3.66	BROWN	SAND	PACKED	
									3.66	4.57	BROWN	GRAVEL	SAND	LOOSE
									4.57	7.01	GREY	CLAY	SOFT	
									7.01	23.47	GREY	SAND	CLAY	SILT
									23.47	29.87	GREY	CLAY	SILT	SOFT
									29.87	35.66	GREY	SAND	CLEAN	FINE SAND
6923350	636724	4877500	336.663696	-	11.2776	45.4609	Water Supply	Domestic	0.00	8.53	BROWN	SAND	CLEAN	
6924655	637455.6	4877609	335.470886	-		-	Water Supply	Domestic	0.00	11.28	BROWN	SAND	PACKED	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
[illegible]	[illegible]	[illegible]	[illegible]	-		-	[illegible]	[illegible]	11.28	19.20	BROWN	SAND	WATER-BEARING	CLEAN
7193230	637452	4876994	-	-		-	Abandoned-Other		-	-	-	-	-	-
7213031	636794	4877246	-	-		-	Abandoned-Other	Not Used	-	-	-	-	-	-
7219787	636675	4877340	-	-		-	Abandoned-Other		-	-	-	-	-	-
7219788	636790	4877278	-	-		-	Abandoned-Other		-	-	-	-	-	-
7219789	636873	4877365	-	-		-	Abandoned-Other		-	-	-	-	-	-
6908106	636489.6	4877072	336.769561	7.31519985	5.7912	22.73	Water Supply	Domestic	0.00	7.32		MEDIUM SAND		
6908111	636457.6	4877323	335.951568	16.7639999	5.4864	13.64	Water Supply	Domestic	0.00	7.62		PREVIOUSLY DUG		
									7.62	8.84		CLAY		
									8.84	10.06		QUICKSAND		
									10.06	10.67		CLAY		
									6.10	16.76		FINE SAND		
6908207	637789.6	4876983	337.210632	8.22959995	6.096	22.73	Water Supply	Domestic	0.00	8.23		MEDIUM SAND		
6908286	637599.6	4876805	333.87973	32.3087997	30.1752	18.18	Water Supply	Livestock / Domestic	0.00	0.61		TOPSOIL		
									0.61	9.75	RED	CLAY		
									9.75	28.96	BLUE	CLAY		
									28.96	30.18		COARSE SAND		
									30.18	32.31		COARSE SAND	GRAVEL	
6908291	638010.6	4877051	336.678649	14.6303997	12.192	18.18	Water Supply	Domestic	0.00	14.63	GREY	MEDIUM SAND		
6908292	638004.6	4877092	338.212463	14.9351997	12.192	22.73	Water Supply	Domestic	0.00	14.94		FINE SAND		
6908295	637691.6	4876805	330.221008	14.6303997	12.192	18.18	Water Supply	Domestic	0.00	14.63		FINE SAND		
6908296	637855.6	4876701	327.324798	9.14400005	6.7056	13.64	Water Supply	Domestic	0.00	1.52		CLAY	STONES	
									1.52	9.14		MEDIUM SAND		
6908298	637748.6	4876849	327.989227	15.2399998	11.2776	22.73	Water Supply	Domestic	0.00	15.24		MEDIUM SAND		
6908312	637765.6	4876633	329.23529	12.1920004	7.62		Water Supply	Domestic	0.00	0.30		TOPSOIL	MEDIUM SAND	
									0.30	3.66		FINE SAND		
									3.66	5.49	BLUE	CLAY		
									5.49	6.71		COARSE SAND		
									6.71	7.62		CLAY		
									7.62	12.19		FINE SAND		
6908315	637723.6	4876933	334.283325	12.49680	9.144	22.73	Water Supply	Domestic	0.00	12.50		MEDIUM SAND		
6908317	637694.6	4876927	334.034606	15.24000	11.5824	13.64	Water Supply	Domestic	0.00	15.24		MEDIUM SAND		
6908323	636534.6	4877435	335.695953	14.32560	10.3632	22.73	Water Supply	Domestic	0.00	10.36		COARSE SAND		
									10.36	14.33		FINE SAND		
6908324	637508.6	4877937	335.000885	13.71600	8.5344	22.73	Water Supply	Domestic	0.00	13.72		MEDIUM SAND	GRAVEL	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	9.14		MEDIUM SAND	STONES	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6908326	637009.6	4877987	338.294219	17.68880	9.144	113.65	Water Supply	Domestic	9.14	17.07		COARSE SAND	GRAVEL	
6908328	636664.6	4877771	334.816101	14.6303997	10.668	18.18	Water Supply	Domestic	0.00	5.18		MEDIUM SAND		
									5.18	9.14		CLAY		
									9.14	14.63		MEDIUM SAND		
6908329	636487.6	4877613	337.510192	4.87680006	1.8288	4.55	Water Supply	Domestic	0.00	1.83		MEDIUM SAND		
									1.83	4.88		QUICKSAND		
6908332	637485.6	4878026	334.995513	14.3256006	8.5344	31.82	Water Supply	Irrigation	0.00	11.28		COARSE SAND		
									11.28	14.33		FINE SAND		
6908334	637388.6	4878088	331.921722	17.6784	7.62	136.38	Water Supply	Irrigation	0.00	0.30		TOPSOIL		
									0.30	6.10	BROWN	TOPSOIL	MEDIUM SAND	
									6.10	17.07		MEDIUM SAND		
									17.07	17.68		COARSE SAND		
6908336	636502.6	4877563	337.152191	10.9728003	4.2672	18.18	Water Supply	Domestic	0.00	3.66		PREVIOUSLY DUG		
									3.66	9.75		MEDIUM SAND	CLAY	
									9.75	10.97		FINE SAND		
6908337	636534.6	4877569	336.969573	11.2776003	9.144	18.18	Water Supply	Commercial	0.00	6.10		FINE SAND		
									6.10	9.14	BLUE	CLAY		
									9.14	11.28		FINE SAND		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6910881	636464.6	4877673	337.795654	23.7744007			Abandoned-Supply		0.00	1.52	BROWN	SAND		
									1.52	5.49	BROWN	CLAY	SAND	SILT
									5.49	7.01	BLUE	SAND	CLAY	
									7.01	15.24	BROWN	CLAY	SAND	
									15.24	23.77	BLUE	CLAY	SAND	SILT
6911229	637964.6	4877253	341.362243	21.6408005	19.812	27.28	Water Supply	Domestic	0.00	21.64		SAND		
6911230	638014.6	4877223	340.495971	19.8120003	18.288	22.73	Water Supply	Domestic	0.00	1.52		CLAY		
									1.52	19.81		SAND		
6911732	637889.6	4877273	342.324432	21.3360004	18.288	22.73	Water Supply	Domestic	0.00	1.52		CLAY		
									1.52	21.34		SAND		
6911733	637974.6	4877323	341.662109	21.3360004	18.288	22.73	Water Supply	Domestic	0.00	1.52		CLAY		
									1.52	21.34		SAND		
6911734	637914.6	4877228	341.582031	21.3360004	18.288	22.73	Water Supply	Domestic	0.00	1.52		CLAY		
									1.52	21.34		SAND		
6911823	638019.6	4877048	336.455413	14.3256006	10.0584	18.18	Water Supply	Domestic	0.00	2.44	BROWN	CLAY	SAND	
									2.44	6.10	BROWN	SAND		
									6.10	10.06	BROWN	FINE SAND	CLAY	
									10.06	14.33	BROWN	FINE SAND		
6912068	638004.6	4877200	339.9971	19.5072002	14.6304	18.18	Water Supply	Public	0.00	1.52	BROWN	SAND	CLAY	STONES
									1.52	14.02	BROWN	SAND		
									14.02	19.51	BROWN	SAND		
6912165	638010.6	4877150	339.902191	21.9456005	17.0688	22.73	Water Supply	Public	0.00	1.22	BROWN	CLAY		
									1.22	17.07	BROWN	SAND	CLAY	
									17.07	21.95	BROWN	SAND		
6912662	637492.6	4877924	335.055114	21.3360004	10.9728	45.46	Water Supply	Domestic	0.00	5.18	GREY	SAND		
									5.18	10.97	GREY	SAND	CLAY	
									10.97	21.34		FINE SAND		
6912839	636424.6	4877244	336.987548	17.9832001	7.3152	27.28	Water Supply	Domestic	0.00	1.22		PREVIOUSLY DUG		
									1.22	5.49	BROWN	SAND		
									5.49	10.06	YELLOW	CLAY	SAND	
									10.06	15.85	BROWN	SILT	SAND	CLAY
									15.85	17.98	BROWN	FINE SAND		
6912862	636454.6	4877019	335.906829	38.1000023	10.9728	50.01	Water Supply	Domestic	0.00	1.22	BROWN	SAND	GRAVEL	
									1.22	3.66	BROWN	SAND		
									3.66	10.06	YELLOW	CLAY		
									10.06	20.73	GREY	SILT	CLAY	
									20.73	33.53	GREY	CLAY		
									33.53	38.10	GREY	FINE SAND		
6913618	636464.6	4877173	337.557678	35.052002	12.192	45.46	Water Supply	Commerical	0.00	7.62	BROWN	SAND		
									7.62	12.19	BROWN	CLAY		
									12.19	33.53	BLUE	CLAY	SOFT	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
									33.53	35.05	BLUE	FINE SAND		
6913738	637714.6	4876723	325.282379	15.2399998		22.73	Abandoned-Supply		0.00	10.67		SAND	DRY	
									10.67	15.24		SAND		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6914058	636414.6	4877573	337.550292	27.4320011	9.144	9.09	Water Supply	Domestic	0.00	3.66	BROWN	SAND	LOOSE	
									3.66	10.06	BROWN	SAND	CLAY	
									10.06	20.12	BROWN	SAND	LOOSE	
									20.12	21.03	BLUE	CLAY	DENSE	
									21.03	23.77	BLUE	CLAY	SANDY	SOFT
									23.77	27.43	BLUE-GREY	QUICKSAND	SILT	SOFT
6915206	636464.6	4877573	337.476959	34.7472	10.9728	68.19	Water Supply	Domestic	0.00	6.40	BROWN	SAND		
									6.40	9.14	YELLOW	CLAY	SAND	
									9.14	20.73	BROWN	SILT	CLAY	
									20.73	32.92	GREY	CLAY	SILT	
									32.92	34.75	BROWN	SAND		
6916040	637314.6	4877873	332.090789	13.7160006	4.8768	68.19	Water Supply	Domestic	0.00	0.30	BROWN	TOPSOIL		
									0.30	4.88	BROWN	SAND	CLAY	
									4.88	11.28	BROWN	SAND		
									11.28	13.72	BLUE	FINE SAND		
6916111	637864.6	4877073	339.267395	17.0688		22.73	Water Supply	Domestic	0.00	3.05	BROWN	CLAY	SANDY	
									3.05	15.54	BROWN	COARSE SAND		
									15.54	17.07	BROWN	MEDIUM SAND		
6916112	637814.6	4877073	340.229309	18.8976002	12.8016	18.18	Water Supply	Domestic	0.00	2.74	BROWN	CLAY	SANDY	
									2.74	16.15	BROWN	MEDIUM SAND		
									16.15	18.90	BROWN	FINE SAND		
6916113	637764.6	4876973	336.926513	34.4424019	13.4112	18.18	Water Supply	Domestic	0.00	5.49	BROWN	CLAY	SANDY	
									5.49	20.42	BROWN	SAND	CLAY	LAYERED
									20.42	29.57	GREY	CLAY	SILTY	
									29.57	32.00	GREY	CLAY	STONES	
									32.00	33.53	GREY	FINE SAND	SILTY	
									33.53	34.44	GREY	FINE SAND		
6916668	637814.6	4877073	340.229309	18.2880001		22.73	Water Supply	Domestic	0.00	2.13		CLAY		
									2.13	13.72		SAND	CLAY	
									13.72	18.29		FINE SAND		
6916753	636464.6	4877323	336.057067	16.1543999	5.4864	13.64	Water Supply	Domestic	0.00	1.83		PREVIOUSLY DUG		
									1.83	9.14	BROWN	SAND	DRY	
									9.14	12.19	BROWN	SAND	CLAY	
									12.19	13.72	GREY	CLAY	LOOSE	
									13.72	15.54	GREY	SAND	CLAY	LIGHT-COLOURED
									15.54	16.15	BROWN	SAND		
6916754	638014.6	4877123	339.487274	17.6784	10.9728	18.18	Water Supply	Domestic	0.00	9.14	BROWN	SAND	DRY	
									9.14	14.63	BROWN	SAND		
									14.63	17.68	BROWN	SAND	CLAY	LOOSE
6917055	638014.6	4877023	335.910461	17.0688	12.192	27.28	Water Supply	Domestic	0.00	3.66	BROWN	CLAY	SANDY	
									3.66	17.07	BROWN	SAND		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6917739	637784.6	4876699	331.481506	12.1920004	6.7056	22.73	Water Supply		0.00	0.61	BLACK	TOPSOIL		
									0.61	6.71		FINE SAND	FINE SAND	
									6.71	12.19	BROWN	SAND		
6917903	637599.6	4876805	333.87973	20.7264004	10.668	45.46	Water Supply	Domestic	0.00	5.18	BROWN	SAND	CLAY	
									5.18	15.85	BROWN	SAND		
									15.85	16.76	BROWN	SAND	CLAY	
									16.76	20.73	BROWN	SAND		
6917906	636947	4877772	332.503387	24.9936008	6.096	31.82	Water Supply	Domestic	0.00	13.72	BROWN	SAND	CLAY	
									13.72	21.03	BLUE	CLAY	SOFT	
									21.03	22.86	BLUE	CLAY	SAND	FINE SAND
									22.86	24.99	BLUE	SAND		
6917907	636947	4877772	332.503387	33.2232018	6.7056	27.28	Water Supply	Domestic	0.00	14.33	BROWN	SAND	CLAY	
									14.33	26.82	BLUE	CLAY	SOFT	
									26.82	28.65	BLUE	CLAY	SAND	
									28.65	30.48	BLUE	CLAY		
									30.48	33.22	BLUE	SAND	FINE SAND	
6918902	637599.6	4876805	333.87973	16.1543999	7.62	27.28	Water Supply	Domestic	0.00	5.49	BROWN	SAND	CLAY	
									5.49	16.15	BROWN	SAND		
6918978	637793	4876710	331.233337	34.7472	4.572	54.55	Water Supply	Domestic	0.00	5.79	BROWN	SAND	SILT	SOFT
									5.79	7.01	BROWN	SAND	CLAY	
									7.01	12.19	BROWN	GRAVEL	HARD	
									12.19	24.69	BLUE	CLAY	SOFT	
									24.69	33.53	BROWN	SAND	COARSE SAND	
									33.53	34.75	BLUE	CLAY		
6918990	637793	4876710	331.233337	21.6408005	6.096	54.55	Water Supply	Domestic	0.00	0.30		TOPSOIL		
									0.30	6.40	BROWN	SAND	CLAY	SOFT
									6.40	18.90	BLUE	CLAY		
									18.90	21.64				
6919467	636440.6	4877323	335.658935	17.6784	7.9248	27.28	Water Supply	Domestic	0.00	4.88	BROWN	SAND		
									4.88	7.62	YELLOW	CLAY		
									7.62	14.02	BROWN	SAND		
									14.02	14.63	GREY	CLAY		
									14.63	15.54	GREY	SILT		
									15.54	17.68	BROWN	SAND		
6908112	636405.6	4877456	335.174194	17.6784	9.144	22.73	Water Supply	Livestock / Domestic	0.00	7.32		PREV. DRILLED		
									7.32	8.53	BLUE	CLAY		
									8.53	17.68		FINE SAND		
6908325	637382.6	4877839	334.059265	13.7160006	8.5344	22.73	Water Supply	Domestic	0.00	13.72		MEDIUM SAND	GRAVEL	
6908333	637668.6	4877985	338.195068	19.2024002	10.3632	63.65	Water Supply	Domestic	0.00	10.36		MEDIUM SAND		
									10.36	19.20		FINE SAND		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6914559	636664.6	4877623	335.564971	29.8703995	12.4968	27.28	Water Supply	Domestic	0.00	4.57	BROWN	SAND		
									4.57	9.75	YELLOW	CLAY		
									9.75	20.73	GREY	SILT	CLAY	
									20.73	23.77	GREY	CLAY		
									23.77	24.99	GREY	SILT		
									24.99	27.74	GREY	CLAY		
									27.74	29.87	GREY	FINE SAND		
6914560	636564.6	4877573	336.838867	29.8703995	12.192	22.73	Water Supply	Domestic	0.00	3.96	BROWN	SAND		
									3.96	9.14	YELLOW	CLAY		
									9.14	20.73	GREY	SILT	CLAY	
									20.73	22.86	GREY	CLAY		
									22.86	24.69	GREY	SILT		
									24.69	28.04	GREY	CLAY		
									28.04	29.87	GREY	FINE SAND		
6914901	638014.6	4877073	337.439208	15.2399998			Observation Wells	Not Used	0.00	2.74	BROWN	SAND	SILT	LOOSE
									2.74	3.96	BROWN	SILT	CLAY	SANDY
									3.96	15.24	BROWN	FINE SAND	MEDIUM SAND	PACKED
6916114	637814.6	4876973	335.489288	15.2399998	8.8392	27.28	Water Supply	Domestic	0.00	0.61	BROWN	CLAY		
									0.61	5.18	BROWN	CLAY	SANDY	
									5.18	11.89	BROWN	MEDIUM SAND	CLAY	LAYERED
									11.89	15.24	BROWN	FINE SAND		
6916115	637714.6	4876973	335.721893	20.7264004	11.8872	18.18	Water Supply	Domestic	0.00	3.66	BROWN	CLAY	SANDY	
									3.66	12.50	BROWN	MEDIUM SAND		
									12.50	18.90	BROWN	FINE SAND		
									18.90	20.73	GREY	FINE SAND		
6916311	637814.6	4877023	339.16571	21.3360004	11.8872	22.73	Water Supply	Domestic	0.00	8.84	BROWN	CLAY	SANDY	
									8.84	18.29	BROWN	SAND	CLAY	LAYERED
									18.29	21.34	BROWN	SAND		
6916313	637714.6	4877023	337.695434	17.3736	7.62	45.46	Water Supply	Domestic	0.00	0.30	BLACK	TOPSOIL		
									0.30	4.57	BROWN	CLAY		
									4.57	9.75	BROWN	COARSE SAND		
									9.75	13.72	BROWN	SAND	CLAY	
									13.72	17.37	BROWN	SAND		
6916314	637864.6	4876973	331.148803	30.4799995	10.668	27.28	Water Supply	Domestic	0.00	0.61	BROWN	TOPSOIL	SANDY	
									0.61	15.54	BROWN	SAND		
									15.54	16.76	BROWN	CLAY	SANDY	
									16.76	28.65	BLUE	CLAY	SANDY	
									28.65	30.48	BLUE	SAND		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6916349	636514.6	4877523	336.760253	35.3568001	5.4864	45.46	Water Supply	Domestic	0.00	6.40	YELLOW	SAND	CLAY	
									6.40	17.68	GREY	SAND	CLAY	SOFT
									17.68	27.43	YELLOW	CLAY	SOFT	
									27.43	32.61	GREY	TILL		
									32.61	35.36	GREY	FINE SAND	CLEAN	
6917363	636414.6	4877423	334.993621	17.3736	5.4864	13.64	Water Supply	Domestic	0.00	10.36	BROWN	SAND	DRY	
									10.36	14.02	BROWN	SAND	CLAY	
									14.02	17.37	BROWN	FINE SAND	WATER-BEARING	
6917705	636523	4877495	336.426635	124.968002	35.052	77.28	Water Supply	Domestic / Municipal	0.00	0.61		TOPSOIL		
									0.61	8.23	BROWN	FINE SAND		
									8.23	34.75	BROWN	FINE SAND	CLAY	
									34.75	117.04	GREY	SAND	CLAY	DENSE
									117.04	118.87		MEDIUM SAND	COARSE SAND	
									118.87	122.22		CLAY		
									122.22	122.83		MEDIUM SAND	COARSE SAND	
									122.83	124.97		CLAY	TILL	
6918298	637628.6	4876894	334.848236	13.1064005	7.62	22.73	Water Supply	Public	0.00	7.62	BROWN	SAND		
									7.62	13.11	BROWN	SAND		
6920075	637295	4877793	332.955627	145.694397			Test Hole	Not Used	0.00	8.53		SAND		
									8.53	14.63	BROWN	CLAY	SOFT	
									14.63	25.91		FINE SAND	COARSE SAND	
									25.91	51.21	GREY	CLAY		
									51.21	59.13		CLAY	GRAVEL	HARD
									59.13	116.74		GRAVEL	CLAY	HARD
									116.74	124.36		GRAVEL	CLAY	
									124.36	131.67		CLAY	GRAVEL	
									131.67	134.42		GRAVEL	CLAY	
									134.42	141.43		CLAY	GRAVEL	HARD
									141.43	145.69		SHALE		
6921306	637686	4876817	331.052368	22.5552006	13.1064	22.73	Water Supply		0.00	14.63		UNKNOWN TYPE		
									14.63	22.56	BROWN	FINE SAND		

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6922603	637225	4877785	331.542114	76.2000046	13.716	45.46	Water Supply	Domestic	0.00	4.57	BROWN	SAND	SILT	LOOSE
									4.57	6.10	BROWN	SILT	CLAY	SOFT
									6.10	16.76	BROWN	SAND	SILT	LOOSE
									16.76	18.29	GREY	CLAY	SILT	SOFT
									18.29	22.86	GREY	SILT	SAND	SOFT
									22.86	24.99	GREY	CLAY	SILT	SOFT
									24.99	44.20	GREY	SILT	SAND	SOFT
									44.20	51.82	BROWN	FINE SAND	SILT	LOOSE
									51.82	54.86	GREY	SILT	CLAY	SOFT
									54.86	59.44	GREY	SILT	SAND	CLAY
									59.44	64.01	BROWN	GRAVEL	SAND	SILT
									64.01	68.58	GREY	SILT	GRAVEL	SAND
									68.58	76.20	GREY	CLAY	SILT	
6922821	637279	4877839	331.796813	61.5695992	10.3632	22.73	Water Supply	Domestic	0.00	9.14	BROWN	FINE SAND	SILT	
									9.14	13.72	BROWN	SILT	CLAY	FINE SAND
									13.72	42.67	BROWN	SILT	FINE SAND	
									42.67	45.72	BROWN	SILT	FINE SAND	CLAY
									45.72	48.77	GREY	CLAY	SILT	SOFT
									48.77	54.86	GREY	CLAY	SILT	
									54.86	56.39	BROWN	GRAVEL	SILT	LOOSE
									56.39	59.44	GREY	SILT	CLAY	GRAVEL
									59.44	61.57	GREY	SILT	CLAY	SAND
6922822	637307	4877935	331.628784	9.14400005			Observation Wells		0.00	0.30	BLACK	TOPSOIL		
									0.30	1.83	BROWN	SILT	SAND	CLAY
									1.83	9.14	BROWN	SILT	FINE SAND	
6922823	637225	4877785	331.542114	65.5319977	16.4592	54.55	Water Supply	Domestic	0.00	4.57	BROWN	SAND	SILT	
									4.57	6.10	BROWN	CLAY	SILT	
									6.10	16.76	BROWN	SAND	SILT	
									16.76	18.90	GREY	CLAY	SILT	LAYERED
									18.90	25.91	GREY	SILT	SAND	CLAY
									25.91	51.82	GREY	SILT	SAND	
									51.82	54.86	GREY	SILT	CLAY	
									54.86	59.44	GREY	SILT	SAND	CLAY
									59.44	61.57	GREY	SILT	GRAVEL	
									61.57	64.01	GREY	SAND	GRAVEL	SILT
									64.01	65.53	GREY	CLAY	SILT	SAND
6922824	637279	4877783	332.824249	9.14400005			Observation Wells	Not Used	0.00	0.30	BLACK	TOPSOIL		
									0.30	1.83	BROWN	SILT	SAND	CLAY
									1.83	9.14	BROWN	SILT	FINE SAND	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6922825	637279	4877839	331.796813	82.2959976	35.9664	54.55	Water Supply	Domestic	0.00	0.30	BLACK	TOPSOIL		
									0.30	1.83	BROWN	SILT	SAND	CLAY
									1.83	10.67	BROWN	SILT	FINE SAND	
									10.67	16.76	GREY	CLAY	SILT	LAYERED
									16.76	51.82	GREY	SILT	FINE SAND	CLAY
									51.82	57.91	GREY	CLAY	SILT	SANDSTONE
									57.91	60.96	GREY	SILT	GRAVEL	DRY
									60.96	70.10	GREY	CLAY	GRAVEL	SILT
									70.10	71.63	GREY	CLAY	DENSE	
									71.63	76.20	GREY	SILT	SAND	CEMENTED
									76.20	79.25	GREY	CLAY	DENSE	
									79.25	80.47	BLACK	GRAVEL	SAND	SILT
									80.47	82.30	GREY	SILT	SAND	CLAY
6922826	637307	4877935	331.628784	9.14400005			Observation Wells	Not Used	0.00	0.30	BLACK	TOPSOIL		
									0.30	1.83	BROWN	SILT	SAND	CLAY
									1.83	9.14	BROWN	SILT	FINE SAND	
6923838	637406	4877879	335.008636	23.1648006	6.7056	477.34	Test Hole	Irrigation	0.00	0.61	BROWN	CLAY	SAND	
									0.61	9.14	BROWN	SAND	MEDIUM-GRAINED	
									9.14	10.67	BROWN	FINE SAND		
									10.67	19.81	BROWN	COARSE SAND		
									19.81	23.16	GREY	SAND	SILT	LAYERED
6923839	637349	4878067	331.726623	42.6720009	8.8392	363.69	Test Hole	Irrigation	0.00	0.61	BROWN	TOPSOIL	SANDY	
									0.61	4.27	BROWN	SAND		
									4.27	4.57		GRAVEL	MEDIUM-GRAINED	
									4.57	6.10	BROWN	SAND	GRAVEL	COARSE-GRAINED
									6.10	20.42	BROWN	SAND		
									20.42	22.86	GREY	SAND		
									22.86	42.67	GREY	CLAY	SILT	LAYERED
6923840	637350	4877970	332.455413	42.6720009			Observation Wells	Not Used	0.00	0.30	BROWN	TOPSOIL		
									0.30	2.44	BROWN	CLAY	SILT	
									2.44	3.05	BROWN	SAND		
									3.05	7.92	BROWN	CLAY	SILT	
									7.92	19.51	BROWN	CLAY	SAND	LAYERED
									19.51	40.84	GREY	CLAY	SILT	
									40.84	42.67	GREY	CLAY	STICKY	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6923841	637350	4877970	332.455413	42.6720009			Test Hole	Not Used	0.00	0.61		TOPSOIL		
									0.61	3.05	BROWN	CLAY	SANDY	
									3.05	9.45	BROWN	CLAY	SILT	
									9.45	11.89	BROWN	CLAY	SAND	GRAVEL
									11.89	30.48	BROWN	CLAY	SAND	LAYERED
									30.48	37.80	GREY	CLAY	SANDSTONE	LAYERED
									37.80	42.67	GREY	CLAY	SOFT	
6924057	637999	4876951	332.294342				Abandoned-Other	Not Used						
6924192	637917	4876947	327.488281											
6924196	637908	4876982	329.9776				Abandoned-Other	Domestic						
6924197	637969	4876956	330.98236				Abandoned-Supply							
6924337	637666	4876962	335.350891				Abandoned-Other							
6924352	637667	4877005	336.244689				Abandoned-Other							
6924418	637698	4877030	337.475158				Abandoned-Other							
6924421	636438	4877418	335.106567				Abandoned-Other							
6924422	636438	4877418	335.106567				Abandoned-Other							
6924477	636411	4877564	337.39328				Abandoned-Other							
6924590	637643	4876866	333.485839				Abandoned-Other							
6924593	637436	4877810	334.952911				Abandoned-Other							
6924606	637643	4876866	333.485839				Abandoned-Other							
6924724	636524	4877082	337.042053				Abandoned-Other							
6924824	637349	4878067	331.726623	23.1648006	8.8392	500.07	Water Supply	Domestic	0.00	0.61	BROWN	TOPSOIL		
									0.61	4.27	BROWN	SAND		
									4.27	4.57		GRAVEL		
									4.57	6.10	BROWN	SAND	GRAVEL	
									6.10	21.03	BROWN	SAND		
									21.03	22.86	GREY	SAND		
									22.86	23.16	GREY	CLAY	SILTY	SAND

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6924825	637377.1	4878021	332.6315	24.6888008		0.00	Water Supply	Domestic	0.00	0.30	BROWN	TOPSOIL		
									0.30	4.88	BROWN	SAND		
									4.88	15.85	BROWN	CLAY		
									15.85	24.08	BROWN	SAND	GRAVEL	MEDIUM GRAVEL
									24.08	24.69	GREY	CLAY		
6924826	637406	4877879	335.008636	21.9456005	1.8288	500.07	Water Supply	Livestock	0.00	0.30	BROWN	TOPSOIL		
									0.30	17.68	BROWN	SAND	SILTY	
									17.68	18.29	BROWN	SAND		
									18.29	19.20	BROWN	SAND	GRAVEL	
									19.20	21.34	BROWN	SAND		
									21.34	21.95	GREY	SAND	SILT	
6924827	637377.1	4878021	332.6315	22.8600006			Water Supply	Not Used	0.00	0.30	BROWN	TOPSOIL		
									0.30	6.10	BROWN	SAND	FINE SAND	
									6.10	12.19	BROWN	SAND	COARSE SAND	
									12.19	14.02		GRAVEL	FINE SAND	
									14.02	18.29	GREY	SAND	MEDIUM SAND	COARSE GRAVEL
									18.29	22.86	GREY	SAND	MEDIUM SAND	
6924828	637377.1	4878021	332.6315	24.3840008			Water Supply	Not Used	0.00	5.49	BROWN	CLAY		
									5.49	7.92	BROWN	CLAY	SAND	
									7.92	23.77	BROWN	SAND		
									23.77	24.38	BROWN	SAND	CLAY	
6924829	637377.1	4878021	332.6315	21.3360004			Observation Wells	Not Used	0.00	3.96	BROWN	CLAY	SANDY	
									3.96	7.01	BROWN	SAND	SILTY	DIRTY
									7.01	14.94	BROWN	CLAY	SANDY	
									14.94	16.15	GREY	CLAY	SOFT	
									16.15	18.59	BROWN	CLAY		
									18.59	20.12	BROWN	SAND	SILTY	
									20.12	21.34	BROWN	CLAY	CLAY	SILTY
6924830	637377.1	4878021	332.6315	23.4696007			Observation Wells	Not Used	0.00	5.18	BROWN	CLAY	STONES	
									5.18	6.10	BROWN	SAND		
									6.10	11.58	BROWN	CLAY	STONES	
									11.58	20.42	BROWN	SAND	CLAY	STONES
									20.42	22.86	BROWN	SAND	FINE SAND	
									22.86	23.47	BROWN	CLAY		
6924831	637377.1	4878021	332.6315	23.7744007			Water Supply	Not Used	0.00	3.05	BROWN	SAND		
									3.05	3.66	BROWN	SAND	GRAVEL	
									3.66	22.86	BROWN	SAND	MEDIUM SAND	
									22.86	23.16	BROWN	SAND	FINE SAND	
									23.16	23.77	GREY	SAND	CLAY	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
6924832	637377.1	4878021	332.6315	25.9080009			Water Supply	Not Used	0.00	0.30	BROWN	SAND	TOPSOIL	
									0.30	5.18	BROWN	SAND	MEDIUM SAND	
									5.18	17.07	BROWN	SAND	GRAVEL	
									17.07	25.60	BROWN	SAND	FINE SAND	MEDIUM SAND
									25.60	25.91	BROWN	SAND	CLAY	
6924833	637377.1	4878021	332.6315	23.7744007			Observation Wells	Not Used	0.00	0.30	BROWN	TOPSOIL		
									0.30	1.22	BROWN	CLAY		
									1.22	3.35	GREY	CLAY		
									3.35	7.32	BROWN	CLAY	SAND	
									7.32	8.23	BROWN	CLAY		
									8.23	22.25	BROWN	SAND	FINE SAND	MEDIUM SAND
									22.25	23.77	BROWN	CLAY	SAND	
6924834	637377.1	4878021	332.6315	24.0792007			Water Supply	Not Used	0.00	0.30	BROWN	SAND	TOPSOIL	
									0.30	16.15	BROWN	SAND	FINE SAND	
									16.15	21.95	BROWN	SAND	MEDIUM SAND	
									21.95	22.25	GREY	CLAY	STONES	
									22.25	23.77	GREY	SAND		
									23.77	24.08	GREY	CLAY		
6924835	637377.1	4878021	332.6315	22.8600006		9.09218	Observation Wells	Not Used	0.00	6.71	BROWN	SAND	SILT	
									6.71	8.84	BROWN	SILT	SAND	FINE SAND
									8.84	22.86	BROWN	SAND	SILT	FINE SAND
6924836	637377.1	4878021	332.6315	24.0792007		9.09218	Observation Wells	Not Used	0.00	5.79	BROWN	SAND	SILT	FINE SAND
									5.79	14.63	BROWN	SAND	GRAVEL	SAND
									14.63	17.07	BROWN	SAND	GRAVEL	CLAY
									17.07	18.59	BROWN	CLAY		
									18.59	20.12	BROWN	SAND	GRAVEL	
									20.12	24.08	BROWN	SAND	SILT	
6926030	637597.1	4876805	333.946472				Abandoned-Other							
6930047	636472	4876987	336.05014	8.52999973			Observation Wells	Not Used	0.00	8.53	BROWN	SAND	SILTY	
6930078	636442	4877043	335.819274	6.0999999			Observation Wells	Not Used	0.00	0.20	BLACK	TOPSOIL		
									0.20	6.10	BROWN	SAND	SILTY	
6930461	636471	4876986	336.029174	6.30000019			Observation Wells		0.00	0.60	BROWN	GRAVEL		
									0.60	3.60	BROWN	SAND	SILT	
									3.60	6.00	BROWN	SAND	SILT	WATER-BEARING
									6.00	6.30	BROWN	SILT	CLAY	
6930462	636471	4876986	336.029174				Abandoned-Other							
6930721	636488	4877032	336.44223	4.5			Observation Wells		0.00	3.00	BROWN	FILL	SAND	
									3.00	4.50	BROWN	FILL	SAND	

Appendix C - Summary of MOECC Water Well Records within 500 m
5426, 5452 & 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stouffville

Well ID	Coordinates		Elevation	Depth	Water Level	Water Yield	Water Use	Water Status	Top	Bottom	Colour	Material 1	Material 2	Material 3
	X	Y	(m)	(m)	(m)	(Lpm)			(m)	(m)				
7052108	637787	4876645	330.590728				Abandoned-Other							
7193230	637452	4876994					Abandoned-Other							
7228778	636497	4877481												
7240908	636440	4877388		4.57200003			Test Hole	Test Hole / Monitoring	0.00	3.66	BROWN	SAND	GRAVEL	
									3.66	4.57	BROWN	FINE SAND		
7240909	636406	4877363		3.0480001				Test Hole / Monitoring	0.00	1.52	BROWN	SAND	TOPSOIL	
									1.52	3.05	BROWN	FINE SAND	WATER-BEARING	
7240910	636396	4877423		3.0480001				Test Hole / Monitoring	0.00	1.52	BROWN	SAND	TOPSOIL	
									1.52	3.05	BROWN	FINE SAND	WATER-BEARING	
7240911	636419	4877457		6.09600019			Test Hole	Test Hole / Monitoring	0.00	3.96	BROWN	FINE SAND		
									3.96	6.10	BROWN	FINE SAND	WATER-BEARING	
7240912	636405	4877444		6.09600019			Observation Wells	Test Hole / Monitoring	0.00	3.96	BROWN	FINE SAND		
									3.96	6.10	BROWN	FINE SAND	WATER-BEARING	
7240913	636393	4877457		6.09600019			Replacement Well	Test Hole / Monitoring	0.00	3.96	BROWN	FINE SAND		
									3.96	6.10	BROWN	FINE SAND	WATER-BEARING	
7245058	636437	4877412					Abandoned-Other	Test Hole / Monitoring						
7248168	636392	4877478					Abandoned-Other							

APPENDIX

C BOREHOLE AND TEST PIT LOGS

LOG OF BOREHOLE OW1

PROJECT: Hydrogeological Investigation
CLIENT: Far Sight Homes
PROJECT LOCATION: 5426 - 5584 Lakeshore Road, Ballantrae, Ontario
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Geoprobe 782DT
Diameter: 127 mm
Date: May/30/2016

REF. NO.: 161-06960-00
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
Ground Surface												
0.0	**TOPSOIL:** 360 mm, sandy topsoil, trace silt, trace organics, black, moist to wet, soft											
0.4	**SAND:** Medium to fine sand, trace silt, red to orange changing to brown to grey with depth, wet to saturated, soft, compact		1	GRAB			W. L. 0.7 mBGL May 30, 2016					
1.5	**SAND:** Medium to fine sand, trace silt, grey, wet to saturated, soft, compact/dense		2	GRAB			Bentonite Holeplug					0 87 10 3
			3	GRAB			Sand / Screen					
	Sand becoming fine below 5.5 m		4	GRAB								
6.1	**END OF BOREHOLE**											

Notes:
1) 50 mm diam. monitoring well installed upon completion, screened 3.05 to 6.1 mbgs
2) MW stick up = 0.87 m
3) Water Level Record:

Date	Depth (mbgs)
30/05/2016	0.65

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3. Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE OW2

PROJECT: Hydrogeological Investigation
CLIENT: Far Sight Homes
PROJECT LOCATION: 5426 - 5584 Lakeshore Road, Ballantrae, Ontario
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Geoprobe 782DT
Diameter: 127 mm
Date: May/30/2016

REF. NO.: 161-06960-00
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
Ground Surface												
0.0	**TOPSOIL:** 230 mm, sandy topsoil, trace silt, some rootlets and organics, dark brown, dry to damp, loose		1									
0.2	**SAND:** Medium to fine sand, some silt, trace gravel, light brown, damp, soft											
2.0	**SAND:** Medium to fine sand, trace silt, grey, wet to saturated, soft		2									0 68 29 3
			3									
			4									
6.1	**END OF BOREHOLE**											

Bentonite Holeplug
W. L. 3.0 mBGL May 30, 2016
Sand
Screen

Notes:
1) 50 mm diam. monitoring well installed upon completion, screened 3.05 to 6.1 mbgs
2) MW stick up = 0.84 m
3) Water Level Record:

Date	Depth (mbgs)
30/05/2016	3.0

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE OW3

PROJECT: Hydrogeological Investigation
CLIENT: Far Sight Homes
PROJECT LOCATION: 5426 - 5584 Lakeshore Road, Ballantrae, Ontario
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Geoprobe 782DT
Diameter: 127 mm
Date: May/31/2016

REF. NO.: 161-06960-00
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
Ground Surface												
0.0	**SANDY SILT:** With some clay, increased sand at bottom, brown becoming grey with depth, moist, soft, dense		1				Bentonite Holeplug					
1.5	**SAND:** Medium to fine sand, trace silt, grey, wet tio saturated, soft		2			▽	W. L. 1.4 mBGL May 31, 2016					
	Sand becoming coarser below 3 m		3				Sand		○			0 94 3 3
	Becoming light brown, increasing hardness, compact		4				Screen					
6.1	**END OF BOREHOLE** Notes: 1) 50 mm diam. monitoring well installed upon completion, screened 3.05 to 6.1 mbgs 2) MW stick up = 0.84 m 3) Water Level Record: Date 31/05/2016 Depth (mbgs) 1.42											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3. Numbers refer to Sensitivity ○ ε=3% Strain at Failure

WSP SOIL LOG 161-06960-00 DRAFT MW LOGS.GPJ SPL.GDT 20/6/16

LOG OF BOREHOLE OW4

PROJECT: Hydrogeological Investigation
CLIENT: Far Sight Homes
PROJECT LOCATION: 5426 - 5584 Lakeshore Road, Ballantrae, Ontario
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Geoprobe 782DT
Diameter: 127 mm
Date: May/30/2016

REF. NO.: 161-06960-00
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa) / WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
Ground Surface											
0.0	**SAND:** Medium to fine sand, trace silt, top 2.5 cm black, bottom light brown to grey, moist, soft		1								
							Bentonite Holeplug				
1.5	**SAND:** Becoming coarser, grey, moist becoming wet below 2.8 m, soft, compact		2								
							W. L. 2.9 mBGL May 30, 2016				
3.0	**SAND and SILT:** Medium sand, grey, wet to saturated, compact		3								0 48 49 3
							Sand				
							Screen				
			4								
6.1	**END OF BOREHOLE** Notes: 1) 50 mm diam. monitoring well installed upon completion, screened 3.05 to 6.1 mbgs 2) MW stick up = 0.85 m 3) Water Level Record: Date 30/05/2016 Depth (mbgs) 2.88										

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100
PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L
WATER CONTENT (%): 10 20 30

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3. Numbers refer to Sensitivity ○ ε=3% Strain at Failure

WSP SOIL LOG 161-06960-00 DRAFT MW LOGS.GPJ SPL.GDT 20/6/16

LOG OF BOREHOLE OW5

PROJECT: Hydrogeological Investigation
CLIENT: Far Sight Homes
PROJECT LOCATION: 5426 - 5584 Lakeshore Road, Ballantrae, Ontario
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Geoprobe 782DT
Diameter: 127 mm
Date: May/31/2016

REF. NO.: 161-06960-00
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION
	Ground Surface						
0.0	**TOPSOIL:** 229 mm, sandy topsoil, some roots and organics, dark brown, dry to damp, loose						
0.2	**SAND:** Medium to fine sand, trace silt, light brown, damp, soft		1			Bentonite Holeplug	
			2			W. L. 2.4 mBGL May 31, 2016	
3.0	**SAND:** Trace silt, light brown, damp, soft Increasing silt below 3.45 m, sand becoming finer, brown, saturated		3			Sand Screen	
4.6	**SILT:** Some sand, trace silt, grey, saturated, very soft		4				
5.2	**SAND:** Trace to some silt, grey, saturated, soft		5				
6.1	**END OF BOREHOLE** Notes: 1) 50 mm diam. monitoring well installed upon completion, screened 2.13 to 5.18 mbgs 2) MW stick up = 0.88 m 3) Water Level Record: Date — Depth (mbgs) 31/05/2016 — 2.41						

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT (w_P) | NATURAL MOISTURE CONTENT (w) | LIQUID LIMIT (w_L)

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
0	13	80	7

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE OW6

PROJECT: Hydrogeological Investigation
CLIENT: Far Sight Homes
PROJECT LOCATION: 5426 - 5584 Lakeshore Road, Ballantrae, Ontario
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Geoprobe 782DT
Diameter: 127 mm
Date: May/31/2016

REF. NO.: 161-06960-00
ENCL NO.:

ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	BLOWS "N" 0.3 m
0.0	Ground Surface			
0.0	**TOPSOIL:** 130 mm, sandy topsoil, trace organics and rootlets, dark brown, damp			
0.1	**SAND:** Medium sand, trace silt, grey, damp to moist, loose	1		
1.6	**SAND:** Medium sand, trace silt, trace gravel, light brown to grey, wet to saturated, dense	2		
3.0	**SAND:** Medium to fine sand, trace gravel below 4.5 m, grey to brown, saturated, dense 2" coarse, wet to saturated sand seam at 3.05 m	3		
		4		
5.2	**SILT:** Trace clay, trace sand, grey saturated, soft, dense	5		
6.1	**END OF BOREHOLE**			

Notes:
1) 50 mm diam. monitoring well installed upon completion, screened 3.05 to 6.1 mbgs
2) MW stick up = 0.88 m
3) Water Level Record:

Date	Depth (mbgs)
31/05/2016	2.0

Bentonite Holeplug
W. L. 2.0 mBGL May 31, 2016
Sand
Screen

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100
PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30

REMARKS AND GRAIN SIZE DISTRIBUTION (%)	GR	SA	SI	CL
	0	9	58	3

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

FAR SIGHT HOMES, BALLANTRAE, ONTARIO

161-06960-00

June 27, 2016

TEST PIT TP16-1

0.0 – 0.15 m TOP SOIL
0.15 – 0.90 m BROWN-ORANGE SILTY SAND, MOIST
0.90 – 3.10 m BROWN FINE TO MEDIUM SAND, TRACE SILT, MOIST

- SAMPLE S1 taken at 0.5 m BGS
- SAMPLE S2 taken at 1 m BGS (submitted for analysis)
- SAMPLE S3 taken at 2 m BGS (submitted for analysis)
- SAMPLE S4 taken at 3 m BGS (submitted for analysis)
- SEEPAGE AT 2.30 - 2.60 m BGS
- CANVING AND WET

TEST PIT TP16-2

0.0 – 0.30 m TOP SOIL
0.30 – 0.70 m BROWN, FINE TO MEDIUM SAND, MOIST
0.70 – 1.00 m BROWN GRAY, GRAVELY COARSE SAND, SOME PEBBLES, SOME COBBLES, TRACE SILT, MOIST
1.00 – 3.05 m BROWN FINE TO MEDIUM SAND, SOME SILT, TRACE GRAVEL, MOIST

- SAMPLE S1 taken at 0.5 m BGS
- SAMPLE S2 taken at 1 m BGS (submitted for analysis)
- SAMPLE S3 taken at 1.35 m BGS
- SAMPLE S4 taken at 2 m BGS (submitted for analysis)
- SAMPLE S5 taken at 3 m BGS (submitted for analysis)
- OPEN AND DRY

TEST PIT TP16-3

0.0 – 0.25 m TOP SOIL
0.25 – 0.80 m BROWN SAND, SOME SILT, MOIST
0.80 – 1.50 m BROWN SILT, SOME CLAY, TRACE SAND, MOIST
1.50 – 3.00 m BROWN SILT, TRACE TO SOME CLAY, TRACE SAND, MOIST

- SAMPLE S1 taken at 0.5 m BGS
- SAMPLE S2 taken at 1 m BGS (submitted for analysis)
- SAMPLE S3 taken at 2 m BGS (submitted for analysis)
- SAMPLE S4 taken at 3 m BGS (submitted for analysis)
- OPEN AND DRY

TEST PIT TP16-4

0.0 – 0.25 m TOPSOIL, BLACK, BROWN, SILTY SAND, ROOTLETS, MOIST
0.25 – 0.75 m BROWN SILTY SAND, MOIST
0.75 – 2.00 m BROWN CLAYEY SILT, TRACE SAND, MOIST
2.00 – 2.50 m BROWN SILT AND CLAY, SOME SAND, MOIST
2.50 – 3.20 m BROWN SAND, TRACE SILT, TRACE CLAY, MOIST TO WET

- SAMPLE S1 taken at 1 m BGS (submitted for analysis)
- SAMPLE S2 taken at 2 m BGS (submitted for analysis)
- SAMPLE S3 taken at 3 m BGS (submitted for analysis)
- SEEPAGE AT 2.00 -2.50 m BGS
- WET AND CAVING

BOREHOLE LOG EXPLANATION FORM

This explanatory section provides the background to assist in the use of the borehole logs. Each of the headings used on the borehole log, is briefly explained.

DEPTH

This column gives the depth of interpreted geologic contacts in metres below ground surface.

STRATIGRAPHIC DESCRIPTION

This column gives a description of the soil based on a tactile examination of the samples and/or laboratory test results. Each stratum is described according to the following classification and terminology.

Soil Classification*		Terminology	Proportion
Clay	<0.002 mm		
Silt	0.002 to 0.06 mm	"trace" (e.g. trace sand)	<10%
Sand	0.06 to 2 mm	"some" (e.g. some sand)	10% - 20%
Gravel	2 to 60 mm	adjective (e.g. sandy)	20% - 35%
Cobbles	60 to 200 mm	"and" (e.g. and sand)	35% - 50%
Boulders	>200 mm	noun (e.g. sand)	>50%

* Extension of MIT Classification system unless otherwise noted.

The use of the geologic term "till" implies that both disseminated coarser grained (sand, gravel, cobbles or boulders) particles and finer grained (silt and clay) particles may occur within the described matrix.

The compactness of cohesionless soils and the consistency of cohesive soils are defined by the following:

COHESIONLESS SOIL		COHESIVE SOIL	
Compactness	Standard Penetration Resistance "N", Blows / 0.3 m	Consistency	Standard Penetration Resistance "N", Blows / 0.3 m
Very Loose	0 to 4	Very Soft	0 to 2
Loose	4 to 10	Soft	2 to 4
Compact	10 to 30	Firm	4 to 8
Dense	30 to 50	Stiff	8 to 15
Very Dense	Over 50	Very Stiff	15 to 30
		Hard	Over 30

The moisture conditions of cohesionless and cohesive soils are defined as follows.

COHESIONLESS SOILS
Dry
Moist
Wet
Saturated

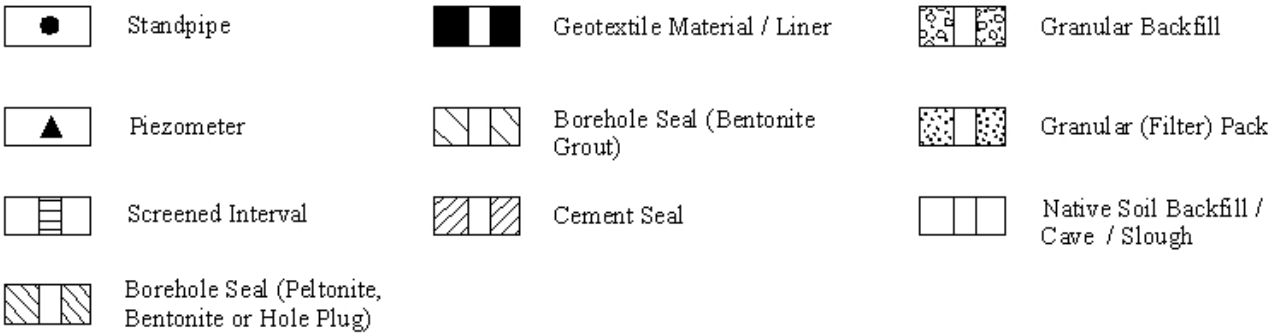
COHESIVE SOILS		
DTPL	-	Drier Than Plastic Limit
APL	-	About Plastic Limit
WTPL	-	Wetter Than Plastic Limit
MWTPL	-	Much Wetter Than Plastic Limit

STRATIGRAPHY

Symbols may be used to pictorially identify the interpreted stratigraphy of the soil and rock strata.

MONITOR DETAILS

This column shows the position and designation of standpipe and/or piezometer ground water monitors installed in the borehole. Also the water level may be shown for the date indicated.



Where monitors are placed in separate boreholes, these are shown individually in the "Monitor Details" column. Otherwise, monitors are in the same borehole. For further data regarding seals, screens, etc., the reader is referred to the summary of monitor details table.

SAMPLE

These columns describe the sample type and number, the "N" value, the water content, the percentage recovery, and Rock Quality Designation (RQD), of each sample obtained from the borehole where applicable. The information is recorded at the approximate depth at which the sample was obtained. The legend for sample type is explained below.

SS	=	Split Spoon	GS	=	Grab Sample
ST	=	Thin Walled Shelby Tube	CS	=	Channel Sample
AS	=	Auger Flight Sample	WS	=	Wash Sample
CC	=	Continuous Core	RC	=	Rock Core

$$\% \text{ Recovery} = \frac{\text{Length of Core Recovered Per Run}}{\text{Total Length of Run}} \times 100$$

Where rock drilling was carried out, the term RQD (Rock Quality Designation) is used. The RQD is an indirect measure of the number of fractures and soundness of the rock mass. It is obtained from the rock cores by summing the length of core recovered, counting only those pieces of sound core that are 100 mm or more in length. The RQD value is expressed as a percentage and is the ratio of the summed core lengths to the total length of core run. The classification based on the RQD value is given below.

RQD Classification	RQD (%)
Very poor quality	< 25
Poor quality	25 - 50
Fair quality	50 - 75
Good quality	75 - 90
Excellent quality	90 - 100

TEST DATA

The central section of the log provides graphs which are used to plot selected field and laboratory test results at the depth at which they were carried out. The plotting scales are shown at the head of the column.

Dynamic Penetration Resistance - The number of blows required to advance a 51 mm diameter, 60º steel cone fitted to the end of 45 mm OD drill rods, 0.3 m into the subsoil. The cone is driven with a 63.5 kg hammer over a fall of 750 mm.

Standard Penetration Resistance - Standard Penetration Test (SPT) "N" Value - The number of blows required to advance a 51 mm diameter standard split-spoon sampler 300 mm into the subsoil, driven by means of a 63.5 kg hammer falling freely a distance of 750 mm. In cases where the split spoon does not penetrate 300 mm, the number of blows over the distance of actual penetration in millimetres is shown as $\frac{xBlows}{mm}$

Water Content - The ratio of the mass of water to the mass of oven-dry solids in the soil expressed as a percentage.

W_P - Plastic Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.

W_L - Liquid Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.

REMARKS

The last column describes pertinent drilling details, field observations and/or provides an indication of other field or laboratory tests that were performed.

BOREHOLE NO. MW15-1

PROJECT NAME: 5452 LAKESHORE ROAD
PROJECT NO.: 141-15539-01 105
CLIENT: ALCORN & ASSOCIATES LTD.
DATE COMPLETED: Sep 14, 2015
BOREHOLE TYPE: 110 mm SOLID STEM AUGER
SUPERVISOR: KSR
GROUND ELEVATION: 334.0 mASL
REVIEWER: TVK

UTM CO-ORDINATES
UTM Zone: 17 NAD: 83
Easting: 637023
Northing: 4877197

DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
0.0	334.0											
0.1	333.9	TOPSOIL: DARK BROWN SILTY SAND TOPSOIL.										
		SAND: BROWN FINE TO MEDIUM SAND, TRACE SILT, MOIST TO SATURATED.			SS1	4		33				
					SS2	4		100				
					SS3	14		100				
					SS4	18		83				WATER LEVEL MEASURED AT 2.89 mBGL ON 09/23/2015
					SS5	19		92				
3.5	330.5	SANDY SILT: BROWN SANDY SILT, TRACE CLAY, MOIST TO WET.										
					SS6	8		100				
4.1	329.9	SAND: BROWN FINE TO MEDIUM SAND, TRACE SILT, MOIST TO SATURATED. - 5 cm SAND AND GRAVEL LAYER AT 4.15 m.										
4.6	329.4	SANDY SILT: BROWN SANDY SILT, TRACE CLAY, MOIST TO WET - 7.5 cm BROWN FINE TO MEDIUM SAND LAYER AT 5.12 m			SS7	22		100				
5.3	328.7	BOREHOLE TERMINATED AT 5.3 m IN SANDY SILT.										

WSP GEOLOGIC (METRIC) WITH MASL 141-1553-01 107-0 LOGS.GPJ WSP_ENV_V1.GDT 10/8/15

BOREHOLE NO. MW15-2

PROJECT NAME: 5452 LAKESHORE ROAD
PROJECT NO.: 141-15539-01 105
CLIENT: ALCORN & ASSOCIATES LTD.
DATE COMPLETED: Sep 14, 2015
BOREHOLE TYPE: 110 mm SOLID STEM AUGER
SUPERVISOR: KSR
GROUND ELEVATION: 333.5 mASL
REVIEWER: TVK

DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	UTM CO-ORDINATES / REMARKS
0.0	333.5									10 20 30	10 20 30	UTM Zone: 17 NAD: 83 Easting: 637040 Northing: 4877136
0.2	333.3	TOPSOIL: LIGHT TO DARK BROWN SILTY SAND TOPSOIL.										
		SAND: BROWN - GREY FINE TO MEDIUM SAND, TRACE SILT, TRACE GRAVEL, MOIST.			SS1	4		57				
1.5	332.0	SANDY SILT: BROWN - GREY SANDY SILT, TRACE CLAY, TRACE GRAVEL.			SS2	19		80				
2.1	331.4	SAND: GREY MEDIUM SAND, TRACE SILT, MOIST TO WET.			SS3	24		70				WATER LEVEL MEASURED AT 3.46 mBGL ON 09/23/2015
4.6	328.9	SILTY SAND: GREY SILTY FINE SAND, WET TO SATURATED.			SS4	21		70				
5.3	328.2	BOREHOLE TERMINATED AT 5.3 m IN SILTY SAND.										

BOREHOLE NO. MW15-3

PROJECT NAME: 5452 LAKESHORE ROAD
PROJECT NO.: 141-15539-01 105
CLIENT: ALCORN & ASSOCIATES LTD.
DATE COMPLETED: Sep 14, 2015
BOREHOLE TYPE: 110 mm SOLID STEM AUGER
SUPERVISOR: KSR
GROUND ELEVATION: 332.5 mASL
REVIEWER: TVK

UTM CO-ORDINATES
UTM Zone: 17 NAD: 83
Easting: 637104
Northing: 4877164

DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
0.0	332.5											
		TOPSOIL: DARK BROWN SILTY SAND TOPSOIL.										
0.3	332.2	SAND: LIGHT BROWN TO GREY FINE TO MEDIUM SAND, TRACE SILT, MOIST.			SS1	3		57				
					SS2	12		60				
1.7	330.8	SAND AND GRAVEL : COARSE SAND AND GRAVEL, TRACE COBBLE, MOIST.			SS3	14		63				
1.9	330.6	SILT: GREY SILT, SOME CLAY, TRACE SAND.										
2.3	330.2	SILTY SAND: GREY SILTY SAND, TRACE CLAY, TRACE GRAVEL, WET TO SATURATED.			SS4	20		83				WATER LEVEL MEASURED AT 2.38 mBGL ON 09/23/2015
					SS5	9		40				
					SS6	19		79				
5.0	327.5	SILT: GREY SILT, SOME SAND, TRACE CLAY, WET TO SATURATED.			SS7	14		83				
5.3	327.2	BOREHOLE TERMINATED AT 5.3 m IN SILT.										

WSP GEOLOGIC (METRIC) WITH MASL 141-1553-01 107-0 LOGS.GPJ WSP_ENV_V1.GDT 10/8/15

BOREHOLE NO. MW15-4

PROJECT NAME: 5452 LAKESHORE ROAD
PROJECT NO.: 141-15539-01 105
CLIENT: ALCORN & ASSOCIATES LTD.
DATE COMPLETED: Sep 14, 2015
BOREHOLE TYPE: 110 mm SOLID STEM AUGER
SUPERVISOR: KSR
GROUND ELEVATION: 334.0 mASL
REVIEWER: TVK

DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
0.0	334.0											**UTM CO-ORDINATES** UTM Zone: 17 NAD: 83 Easting: 637158 Northing: 4877130
0.2	333.8	TOPSOIL: BROWN SILTY SAND TOPSOIL.										
		SAND: BROWN FINE SAND, TRACE SILT, MOIST.			SS1	3		63				
					SS2	2		67				
1.6	332.4	SILT AND SAND: BROWN SILT AND SAND, TRACE CLAY.			SS3	15		63				
2.1	331.9	SAND: GREY FINE TO MEDIUM SAND, TRACE SILT, MOIST TO SATURATED - 10.2 cm GREY SILTY SAND LAYER AT 3.3 m, SATURATED.		▼	SS4	9		8				WATER LEVEL MEASURED AT 3.19 mBGL ON 09/23/2015
4.6	329.4	SILTY SAND: GREY SILTY SAND, TRACE CLAY, WET TO SATURATED.			SS5	14		100				
5.3	328.7	BOREHOLE TERMINATED AT 5.3 m IN SILTY SAND.										

WSP GEOLOGIC (METRIC) WITH MASL 141-1553-01 107-0 LOGS.GPJ WSP_ENV_V1.GDT 10/8/15

BOREHOLE NO. MW15-5

PROJECT NAME: 5452 LAKESHORE ROAD
PROJECT NO.: 141-15539-01 105
CLIENT: ALCORN & ASSOCIATES LTD.
DATE COMPLETED: Sep 14, 2015
BOREHOLE TYPE: 110 mm SOLID STEM AUGER
SUPERVISOR: KSR
GROUND ELEVATION: 334.0 mASL
REVIEWER: TVK

DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
0.0	334.0	TOPSOIL: BROWN SILTY SAND TOPSOIL										**UTM CO-ORDINATES** UTM Zone: 17 NAD: 83 Easting: 637148 Northing: 4877105
0.3	333.7	SAND: BROWN MEDIUM TO FINE SAND, TRACE TO SOME SILT, TRACE TO SOME GRAVEL, MOIST TO WET. - GREY BELOW 1.0 m - SATURATED BELOW 3.7 m			SS1	4		67				
					SS2	16		67				
					SS3	15		73				
					SS4	44		73		44		
					SS5	13		60				WATER LEVEL MEASURED AT 3.62 mBGL ON 09/23/2015
4.0	330.0	SILTY SAND: BROWN AND GREY SILTY SAND, TRACE CLAY, SATURATED.			SS6	14		90				
4.6	329.4	SAND: LIGHT BROWN COARSE TO FINE SAND, SOME SILT, TRACE CLAY, SATURATED.			SS7	14		87				
5.3	328.7	BOREHOLE TERMINATED AT 5.3 m IN SAND.										

WSP GEOLOGIC (METRIC) WITH MASL 141-1553-01 107-0 LOGS.GPJ WSP_ENV_V1.GDT 10/8/15

BOREHOLE NO. MW15-6

PROJECT NAME: 5452 LAKESHORE ROAD
PROJECT NO.: 141-15539-01 105
CLIENT: ALCORN & ASSOCIATES LTD.
DATE COMPLETED: Sep 14, 2015
BOREHOLE TYPE: 110 mm SOLID STEM AUGER
SUPERVISOR: KSR
GROUND ELEVATION: 333.5 mASL
REVIEWER: TVK

DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	UTM CO-ORDINATES / REMARKS
0.0	333.5									10 20 30	10 20 30	UTM Zone: 17 NAD: 83 Easting: 637092 Northing: 4877133
0.2	333.3	TOPSOIL: BROWN SILTY SAND TOPSOIL.										
		SAND: BROWN AND GREY FINE TO MEDIUM SAND, TRACE TO SOME SILT, TRACE CLAY MOIST.			SS1	3		40				
					SS2	15		63				
3.0	330.5	SILTY SAND: GREY SILTY SAND, WET TO SATURATED.		▼	SS3	20		70				
3.8	329.7	SILTY SAND TO SANDY SILT: GREY SILTY SAND TO SANDY SILT, TRACE TO SOME CLAY, SATURATED.			SS4	26		60				WATER LEVEL MEASURED AT 3.73 mBGL ON 09/23/2015
5.3	328.2	BOREHOLE TERMINATED AT 5.3 m IN SAND.										

WSP GEOLOGIC (METRIC) WITH MASL 141-1553-01 107-0 LOGS.GPJ WSP_ENV_V1.GDT 10/8/15

Table 1 – Test Pit Logs
141-15539-00
5452 Lakeshore Road, Ballantrae

Depth	Description
TP14-01	
0.00 – 0.12 m	Brown-black silty sand topsoil, trace rootlets, moist.
0.12 – 0.90 m	Brown fine sand, some silt, moist.
0.90 – 2.30 m	Grey silty sand, trace clay, trace gravel, moist.
2.30 – 3.00 m	Grey coarse sand, some gravel, trace cobble, moist to wet.
3.00 – 3.10 m	Grey clayey silt, trace sand, trace gravel, moist to wet.
	➢ Sample #1 taken at 0.2 – 0.5 m. ➢ Sample #2 taken at 1.0 – 1.2 m (Submitted). ➢ Sample #3 taken at 2.3 – 2.7 m. ➢ Sample #4 taken at 3.0 – 3.1 m. ➢ Groundwater seepage at 2.3 m.
TP14-02	
0.00 – 0.17 m	Brown-black silty sand topsoil, trace rootlets, moist.
0.17 – 1.80 m	Brown fine sand, some silt, trace clay moist.
1.80 – 2.20 m	Grey fine sand, some silt, trace clay moist.
2.20 – 2.50 m	Grey coarse sand, some gravel, some pebble, trace cobble, moist to wet.
2.50 – 3.00 m	Grey clayey silt, trace sand, trace gravel, moist to wet.
	➢ Sample #1 taken at 0.5 – 0.8 m (Submitted). ➢ Sample #2 taken at 2.0 – 2.2 m. ➢ Sample #3 taken at 2.2 – 2.5 m. ➢ Sample #4 taken at 2.8 – 3.0 m. ➢ Groundwater seepage at 2.2 m.
TP14-03	
0.00 – 0.22 m	Brown-black silty sand topsoil, trace rootlets, moist.
0.22 – 0.70 m	Brown fine sand, some silt, trace clay, moist.
0.70 – 2.20 m	Grey silt and sand, trace clay, moist.
2.20 – 3.05 m	Grey coarse sand, some gravel, some pebble, trace cobble, moist to wet.

- Sample #1 taken at 0.5 – 0.7 m.
- Sample #2 taken at 2.0 – 2.2 m (Submitted).
- Sample #3 taken at 2.2 – 2.4 m.
- Sample #4 taken at 2.9 – 3.05 m.
- Groundwater seepage at 2.2 m.

TP14-04

0.00 – 0.10 m	Brown-black silty sand topsoil, trace rootlets, moist.
0.10 – 2.20 m	Brown fine sand, some silt, trace clay, moist.
2.20 – 3.10 m	Grey fine sand, some silt, trace clay, moist.
3.10 – 4.50 m	Grey clayey silt, trace sand, trace gravel, moist to wet.

- Sample #1 taken at 0.5 – 0.8 m (Submitted).
- Sample #2 taken at 2.0 – 2.2 m.
- Sample #3 taken at 2.8 – 3.0 m.
- Sample #4 taken at 4.0 – 4.5 m.
- Groundwater seepage at 2.2 m.

TP14-05

0.00 – 0.18 m	Brown-black silty sand topsoil, trace rootlets, moist.
0.18 – 1.30 m	Brown fine sand, some silt, moist.
1.30 – 2.15 m	Grey medium sand, trace silt, trace clay, moist.
2.15 – 3.00 m	Grey clayey silt, trace sand, trace gravel, moist to wet.

- Sample #1 taken at 0.5 – 0.8 m.
- Sample #2 taken at 1.8 – 2.15 m (Submitted).
- Sample #3 taken at 2.7 – 3.0 m (Submitted).
- No seepage.

TP14-06

0.00 – 0.12 m	Brown-black silty sand topsoil, trace rootlets, moist.
0.18 – 1.70 m	Brown fine sand, some silt, trace clay, moist.
1.70 – 3.30 m	Grey clayey silt, trace sand, trace gravel, moist.
3.30 – 4.40 m	Grey medium sand, moist to wet.

- Sample #1 taken at 0.2 – 1.0 m (Submitted).
- Sample #2 taken at 3.0 – 3.3 m.
- Sample #3 taken at 4.0 – 4.4 m.
- Groundwater seepage at 4.3 m.

APPENDIX

D INFILTRATION TEST RESULTS

TABLE D-1: TP16-1 (1 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name: Far Sight Homes		**Project NO.:** 161-06960-00	
Location of Test: TP16-1 1 m		**Weather:** Sunny, 35 oC	
Start Date: June 27, 2016		**Infiltration Test Method:** Novia Scotia Pask Permeameter	
Supervised By: TVK/PLM			

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	8	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	52.5

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	6.00

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/10 sec)	COMMENTS
0:10	57.5	(-)	**Soil:** Sand, trace silt
0:20	52	5.5	**Depth (m) :** 1.0 - 1.3m (30 cm hole)
0:30	47.3	4.7	
0:40	45.4	1.9	
0:50	42.5	2.9	
1:00	40	2.5	
1:10	36.6	3.4	
1:20	34.2	2.4	
1:30	31.9	2.3	
1:40	29.4	2.5	
1:50	27.5	1.9	
2:00	25.5	2	
2:10	23.5	2	
2:20	22.5	1	
2:30	20.5	2	
2:40	19	1.5	
2:50	17.9	1.1	
3:00	16.4	1.5	
3:10	15.2	1.2	
3:20	14.2	1	
3:30	13.2	1	
3:40	12.2	1	
3:50	11	1.2	
4:00	10	**1**	
4:10	9	**1**	
4:20	8	**1**	

TABLE D-1: TP16-1 (1 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name: Far Sight Homes		**Project NO.:** 161-06960-00	
Location of Test: TP16-1 1 m		**Weather:** Sunny, 35 oC	
Start Date: June 27, 2016		**Infiltration Test Method:** Novia Scotia Pask Permeameter	
Supervised By: TVK/PLM			

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	8	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	52.5

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	6.00

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/10 sec)	COMMENTS	
4:30	7	**1**		
4:40	6	**1**		
4:50	5	**1**		
5:00	4.2	0.8		
5:10	3.5	0.7		
5:30	2	1.5	Stable Rate of Fall (cm/10 sec)	1.00
5:57	0	2	Stable Rate of Fall (cm/min)	6.00

CALCULATIONS

Saturated Field Hydraulic Conductivity

K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 3150.00

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE D-2: TP16-1 (2 m) INFILTRATION TEST
FAR SIGHT HOMES

Project Name: Far Sight Homes		**Project NO.:** 161-06960-00	
Location of Test: TP16-1 2 m		**Weather:** Sunny, 35 oC	
Start Date: June 27, 2016		**Infiltration Test Method:** Novia Scotia Pask Permeameter	
Supervised By: TVK/PLM			

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	7	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	56.3

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	3.60

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/10 sec)	COMMENTS
0:10	62	(-)	**Soil:** Sand, trace silt
0:20	62	0	**Depth (m) :** 2.0 - 2.22 m (22 cm hole)
0:30	62	0	
0:40	62	0	
0:50	62	0	
1:00	61.1	0.9	
1:10	60.5	0.6	
1:20	59.9	0.6	
1:30	59	0.9	
1:40	58.4	0.6	
1:50	58	0.4	
2:00	57.8	0.2	
2:10	57.1	0.7	
2:20	56.5	0.6	
2:30	55.7	0.8	
2:40	55.1	0.6	
2:50	54.5	0.6	
3:00	53.9	0.6	
3:10	53.4	0.5	
3:20	52.9	0.5	
3:30	52.2	0.7	
3:40	51.7	0.5	
3:50	51.1	0.6	
4:00	50.6	0.5	
4:10	50	0.6	
4:20	49.6	0.4	
4:30	48.9	0.7	
4:40	48.2	0.7	

TABLE D-2: TP16-1 (2 m) INFILTRATION TEST
FAR SIGHT HOMES

Project Name: Far Sight Homes		**Project NO.:** 161-06960-00	
Location of Test: TP16-1 2 m		**Weather:** Sunny, 35 oC	
Start Date: June 27, 2016		**Infiltration Test Method:** Novia Scotia Pask Permeameter	
Supervised By: TVK/PLM			

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	7	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	56.3

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	3.60

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/10 sec)	COMMENTS
4:50	47.7	0.5	
5:00	47	0.7	
5:10	46.5	0.5	
5:20	46	0.5	
5:30	45.2	0.8	
5:40	44.7	0.5	
5:50	44.2	0.5	
6:00	43.7	0.5	
6:10	43.2	0.5	
6:20	42.5	0.7	
6:30	41.8	0.7	
6:40	41.2	0.6	
6:50	40.8	0.4	
7:00	40.2	0.6	
7:10	39.7	0.5	
7:20	39.1	0.6	
7:30	38.6	0.5	
7:40	38	0.6	
7:50	37.3	0.7	
8:00	36.8	0.5	
8:10	36.4	0.4	
8:20	35.8	0.6	
8:30	35.2	0.6	
8:40	34.6	0.6	

TABLE D-2: TP16-1 (2 m) INFILTRATION TEST
FAR SIGHT HOMES

Project Name:	Far Sight Homes	**Project NO.:**	161-06960-00
Location of Test:	TP16-1 2 m	**Weather:**	Sunny, 35 oC
Start Date:	June 27, 2016	**Infiltration Test Method:**	Novia Scotia Pask Permeameter
Supervised By:	TVK/PLM		

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	7	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	56.3

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	3.60

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/10 sec)	COMMENTS	
8:50	34	0.6		
9:00	33.4	0.6		
9:10	32.8	0.6		
9:20	32.3	0.5		
9:30	31.9	0.4		
9:40	31.3	**0.6**		
9:50	30.7	**0.6**		
10:00	30.1	**0.6**		
10:10	29.6	**0.5**		
10:20	29	**0.6**		
10:30	28.4	**0.6**		
10:40	27.8	**0.6**		
10:50	27.2	**0.6**	Stable Rate of Fall (cm/10 sec)	0.60
11:00	26.6	**0.6**	Stable Rate of Fall (cm/min)	3.60

CALCULATIONS

Saturated Field Hydraulic Conductivity

K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 2026.80

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE D-3: TP16-2 (1 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name: Far Sight Homes **Project NO.:** 161-06960-00

Location of Test: TP16-2 1 m **Weather:** Sunny, 35 oC

Start Date: June 27, 2016 **Infiltration Test Method:** Novia Scotia Pask Permeameter

Supervised By: TVK/PLM

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	8	Height of Air Inlet Hole (cm):	20	Soil Factor:	67.3

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	5.368

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/30 sec)	COMMENTS
0:10	59.6	(-)	**Soil:** Gravely sand, trace silt
0:20	57.5	2.1	**Depth (m) :** 0.9 - 1.25 m (35 cm hole)
0:30	55.8	1.7	
0:40	54.4	1.4	
0:50	52.6	1.8	
1:00	51.1	1.5	
1:30	47.4	3.7	
2:00	44.1	3.3	
2:30	40.1	4	
3:00	35.9	4.2	
3:30	33.1	2.8	
4:00	30.1	3	
4:30	27.6	2.5	
5:00	24.9	2.7	
5:30	22.5	2.4	
6:00	20	2.5	
6:30	17.4	2.6	
7:00	15.2	2.2	
7:30	12.7	2.5	
8:00	10.4	2.3	
8:30	8.3	2.1	
9:00	5.9	2.4	
9:30	3.9	2	
10:00	1.6	2.3	Average Rate of Fall (cm/30 sec) 2.68
10:20	0	1.6	Average Rate of Fall (cm/min) 5.37

CALCULATIONS

Saturated Field Hydraulic Conductivity

K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 3612.95

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1992, Technical University of Nova Scotia

TABLE D-3: TP16-2 (1 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name: Far Sight Homes		**Project NO.:** 161-06960-00	
Location of Test: TP16-2 1 m		**Weather:** Sunny, 35 oC	
Start Date: June 27, 2016		**Infiltration Test Method:** Novia Scotia Pask Permeameter	
Supervised By: TVK/PLM			

PERMEAMETER DETAILS					
Auger Hole Diameter (cm):	8	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	67.3

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	5.368

ELASPED TIME (min:sec)	**HEIGHT MEASURMENT (cm)**	**RATE OF FALL (cm/30 sec)**	**COMMENTS**

Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE D-4: TP16-2 (2 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name: Far Sight Homes		**Project NO.:** 161-06960-00	
Location of Test: TP16-2 2 m		**Weather:** Sunny, 35 oC	
Start Date: June 27, 2016		**Infiltration Test Method:** Novia Scotia Pask Permeameter	
Supervised By: TVK/PLM			

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	7	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	56.3

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	7.87

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/30 sec)	COMMENTS
0:30	55.5	(-)	**Soil:** Sand, some silt
1:00	49.6	5.9	**Depth (m) :** 1.9 - 2.12 m (22 cm hole)
1:30	45.6	4	
2:00	41.8	3.8	
2:30	37.3	4.5	
3:00	33.4	3.9	
3:30	29.5	3.9	
4:00	25.7	3.8	
4:30	22.1	3.6	
5:00	17.9	4.2	
5:30	14.9	3	
6:00	11.3	3.6	
6:30	7.4	3.9	
7:00	3.8	3.6	
7:30	0.4	3.4	Average Rate of Fall (cm/30 sec) 3.94
7:40	0	0.4	Average Rate of Fall (cm/min) 7.87

CALCULATIONS

Saturated Field Hydraulic Conductivity

K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 4431.61

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE D-5: TP16-3 (1 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name:	Far Sight Homes	**Project NO.:**	161-06960-00
Location of Test:	TP16-3 1 m	**Weather:**	Sunny, 35 oC
Start Date:	June 27, 2016	**Infiltration Test Method:**	Novia Scotia Pask Permeameter
Supervised By:	TVK/PLM		

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	8	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	30.5

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	0.20

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/min)	COMMENTS
0:10	60	(-)	**Soil:** Silt, some clay, trace sand
0:30	59.7	0.3	**Depth (m) :** 1.0 - 1.30 m (30 cm hole)
1:00	59.7	0	
1:30	59.7	0	
2:00	59.7	0	
5:00	59.4	0.3	
6:00	59.1	0.3	
7:00	58.9	**0.2**	
8:00	58.7	**0.2**	
9:00	58.5	**0.2**	
10:00	58.3	**0.2**	Stable Rate of Fall (cm/min) 0.20

CALCULATIONS

Saturated Field Hydraulic Conductivity

K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 61.00

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE D-6: TP16-3 (2 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name:	Far Sight Homes	**Project NO.:**	161-06960-00
Location of Test:	TP16-3 2 m	**Weather:**	Sunny, 35 oC
Start Date:	June 27, 2016	**Infiltration Test Method:**	Novia Scotia Pask Permeameter
Supervised By:	TVK/PLM		

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	8	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	30.5

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	0.60

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/min)	COMMENTS
0:10	50	(-)	**Soil:** Silt, trace clay and sand
0:20	50	0	**Depth (m) :** 2.0 - 2.3 m (30 cm hole)
0:30	50	0	
1:00	49.9	0.1	
2:00	49.5	0.4	
3:00	48.8	0.7	
4:00	48.1	0.7	
5:00	47.2	0.9	
6:00	46.9	0.3	
7:00	46.3	0.6	
8:00	45.6	0.7	
9:00	45	**0.6**	
10:00	44.4	**0.6**	
11:00	43.8	**0.6**	Stable Rate of Fall (cm/min) 0.60

CALCULATIONS

Saturated Field Hydraulic Conductivity

K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 183.00

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE D-7: TP16-4 (1 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name:	Far Sight Homes	**Project NO.:**	161-06960-00
Location of Test:	TP16-4 1 m	**Weather:**	Sunny, 35 oC
Start Date:	June 27, 2016	**Infiltration Test Method:**	Novia Scotia Pask Permeameter
Supervised By:	TVK/PLM		

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	8	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	30.5

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	0.100

ELASPED TIME (min:sec)	HEIGHT MEASURMENT (cm)	RATE OF FALL (cm/min)	COMMENTS
0:10	61.5	(-)	**Soil:** Clayey silt, trace sand
0:20	61.4	0.1	**Depth (m) :** 0.52 - 0.9 m (38 cm hole)
0:30	61.4	0	
0:40	61.4	0	
0:50	61.4	0	
1:00	61.3	0.1	
2:00	60.5	0.8	Permeameter was moved at 2 minutes.
3:00	60.5	0	
4:00	60.5	0	
5:00	60.5	0	
10:00	60.5	0	
15:00	60.5	0	
20:00	60.5	0	
25:00	60.5	0	
30:00	60.5	0	Stable Rate of Fall (cm/min) <0.1

CALCULATIONS

Saturated Field Hydraulic Conductivity

K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 30.50

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

TABLE D-8: TP16-4 (2 m) INFILTRATION TEST
FAR SIGHT HOMES
161-06960-00

Project Name:	Far Sight Homes	**Project NO.:**	161-06960-00
Location of Test:	TP16-4 2 m	**Weather:**	Sunny, 35 oC
Start Date:	June 27, 2016	**Infiltration Test Method:**	Novia Scotia Pask Permeameter
Supervised By:	TVK/PLM		

PERMEAMETER DETAILS

Auger Hole Diameter (cm):	8	**Height of Air Inlet Hole (cm):**	20	**Soil Factor:**	30.5

Stable Rate of Fall of Water in Permeameter Reservoir (cm/min):	0.100

ELASPED TIME (min)	WATER LEVEL READING (m)	RATE OF FALL (cm/min)	COMMENTS
0:10	50.5	(-)	**Soil:** Silt and clay, some sand
5:00	50.5	0	**Depth (m) :** 2.00 - 2.40 m (40 cm hole)
10:00	50.5	0	Ground water in hole
15:00	50.5	0	
20:00	50.5	0	Stable Rate of Fall (cm/min) <0.1

CALCULATIONS

Saturated Field Hydraulic Conductivity

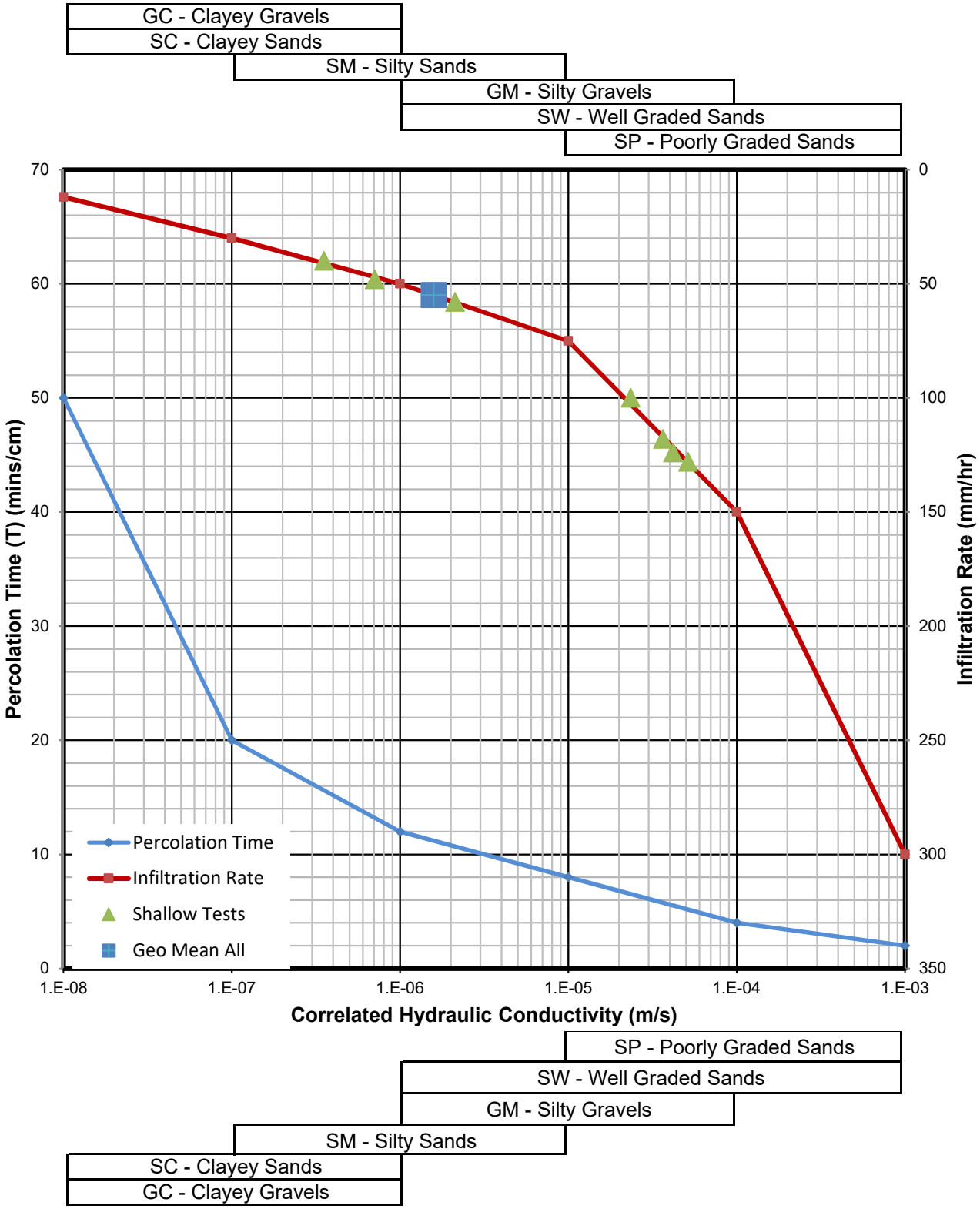
K_fs (mm/day) = Stable Rate of Fall x CSS Soil Factor*

K_fs (mm/day) = 30.50

	Auger Hole Diameter							
Soil Factor	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**	**10.5**
Coarse Sands (CS)	72	69.8	67.3	65.1	62.2	58.9	58.7	55.5
Structured Soils (SS)	56.3	54.5	52.5	50.8	47.2	46.2	45.3	44
Clays (US)	32.4	31.4	30.5	29.5	28	27.4	26.3	25.9

Note: * = Soil Factors were calculated by Canadian Sewage Solutions Inc. based on research from Mooers, J.D., and D.H. Waller, 1993 ON-Site Wastewater Disposal in Nova Scotia, Final Report, On-Site Wastewater Research Program Phase 2 1990-1993. Technical University of Nova Scotia.

Figure D-1 - Infiltration Test Results - Part Lot 31, Concession 7, Uxbridge, Ontario



Relationships Derived From: "Approximate Relationships of Soil Types to Permeability and Percolation Time - Table 2 - Page SG 6-3 - Supplementary Guidelines to the 1997 Ontario Building Code/Code and Guide for Sewage Systems 1997 - September 20, 2004 Update. Ministry of Municipal Affairs and Housing Building and Development Branch

APPENDIX

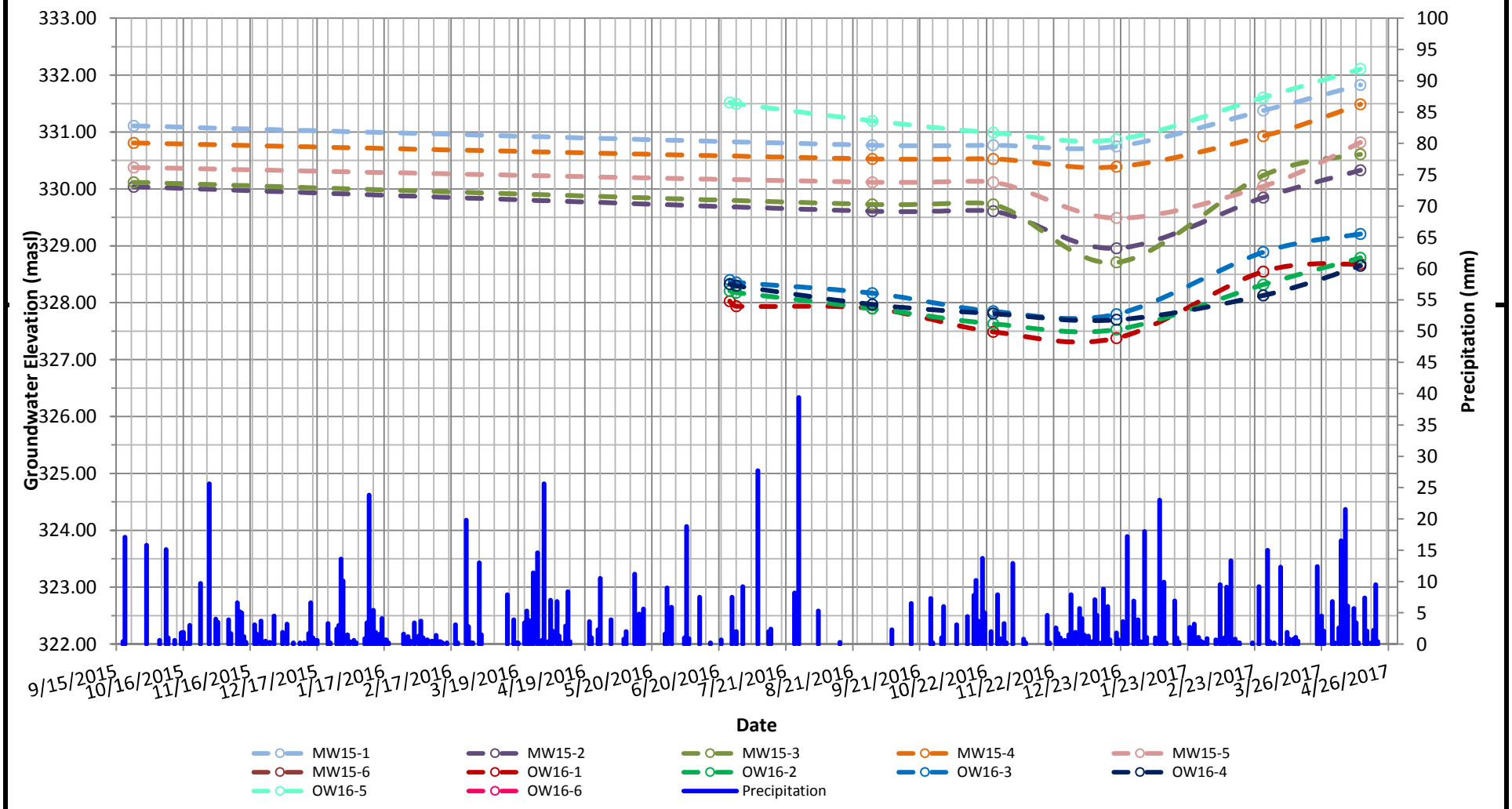
E BI-MONTHLY MONITORING

Table D-1 - Bi-Monthly Monitoring Groundwater Elevations
5426, 5452 5584 Lakeshore Road, Ballantrae, ON
Town of Whitchurch-Stoufffville

Well ID	Easting	Northing	Ground Surface Elevation (masl)	Stick Up (m)	Well Depth (mbgs)	23-Sep-15		25-Jun-16		28-Jun-16		30-Aug-16		25-Oct-16		21-Dec-16		27-Feb-17		13-Apr-17	
						Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbgs)	Water Level Elevation (masl)	Depth to Water (mbgs)	Water Level Elevation (masl)
MW15-1	637023	4877197	334.0	0.75	4.68	2.89	331.11	-	-	-	-	3.23	330.77	3.24	330.76	3.25	330.75	2.62	331.38	2.17	331.83
MW15-2	637040	4877136	333.5	0.71	4.63	3.46	330.04	-	-	-	-	3.89	329.61	4.54	328.96	4.54	328.96	3.65	329.85	3.17	330.33
MW15-3	637104	4877164	332.5	0.67	3.86	2.38	330.12	-	-	-	-	2.77	329.73	3.15	329.35	3.79	328.71	2.26	330.24	1.89	330.61
MW15-4	637158	4877130	334.0	0.76	4.40	3.19	330.81	-	-	-	-	3.47	330.53	3.64	330.36	3.61	330.39	3.07	330.93	2.51	331.49
MW15-5	637148	4877105	334.0	0.73	4.57	3.62	330.38	-	-	-	-	3.88	330.12	4.24	329.76	4.51	329.49	3.95	330.05	3.18	330.82
MW15-6	637092	4877133	333.5	0.84	4.57	3.73	329.77	-	-	-	-	4.14	329.36	4.57	328.93	dry	-	3.03	330.47	2.62	330.88
OW16-1			328.9	0.86	6.01	-	-	0.85	328.03	0.94	327.94	0.98	327.90	1.39	327.49	1.50	327.38	0.33	328.55	0.20	328.68
OW16-2			331.4	0.86	6.00	-	-	3.19	328.21	3.22	328.18	3.50	327.90	3.77	327.63	3.87	327.53	3.08	328.32	2.61	328.79
OW16-3			330.1	0.83	6.02	-	-	1.70	328.40	1.74	328.36	1.93	328.17	2.25	327.85	2.30	327.80	1.21	328.89	0.89	329.21
OW16-4			331.4	0.81	5.89	-	-	3.06	328.33	3.09	328.30	3.42	327.97	3.58	327.81	3.69	327.70	3.26	328.13	2.74	328.65
OW16-5			334.1	0.84	5.00	-	-	2.62	331.52	2.64	331.50	2.94	331.20	3.15	330.99	3.27	330.87	2.53	331.61	2.03	332.11
OW16-6			333.2	0.88	5.96	-	-	2.30	330.89	2.23	330.96	2.43	330.76	2.52	330.67	2.42	330.77	1.73	331.46	1.51	331.68

Water Level Hydrograph

Monitoring Wells and Precipitation



* **Notes:** Climate data obtained from Uxbridge West Climate Station

2016-2017 Water Level Monitoring

Farsight Homes

5426 - 5584 Lakeshore Road, Ballantrae, ON

April 2017

FIGURE D-1

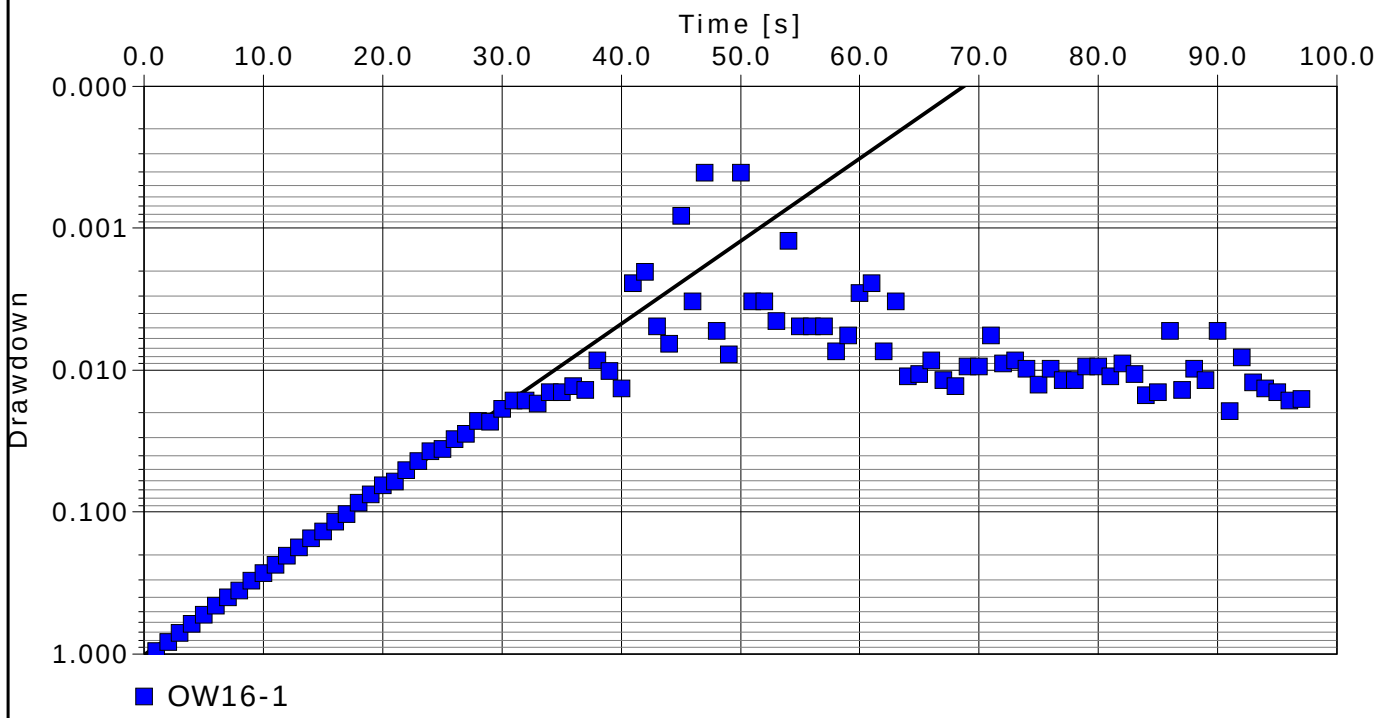
WSP

APPENDIX

F IN-SITU HYDRAULIC CONDUCTIVITY TESTING

WSP	**Slug Test - Analyses Report**	D-1
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-1	Test Well: OW16-1
Test Conducted by: SJD		Test Date: 27/06/2016
Analysis Performed by: SJD	OW16-1 Rising Head Test	Analysis Date: 11/08/2016
Aquifer Thickness: 5.16 m		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
OW16-1	6.89×10^{-5}	

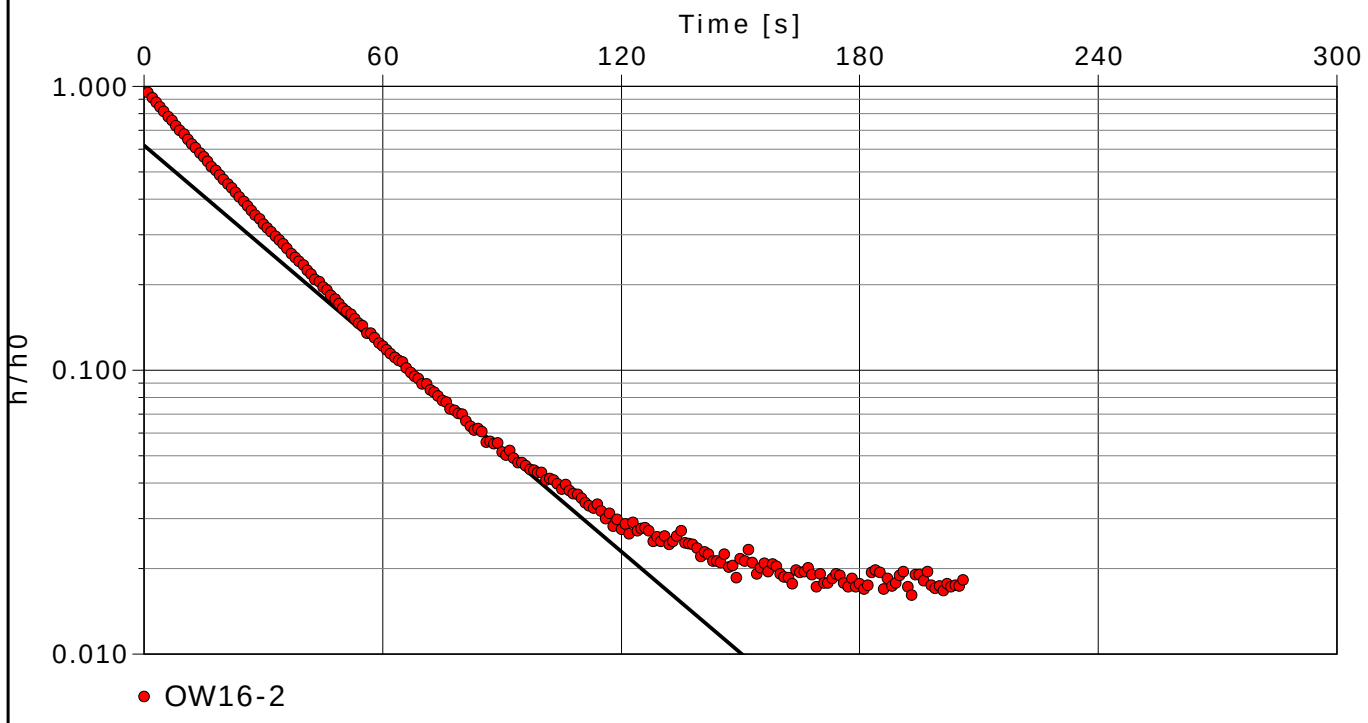
WSP	**Slug Test - Analyses Report**	D-1
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-1	Test Well: OW16-1
Test Conducted by: SJD		Test Date: 27/06/2016
Aquifer Thickness: 5.16 m		

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m²/s]	K [m/s]	S
1	OW16-1 Rising Head	SJD	11/08/2016	Hvorslev	OW16-1		6.89×10^{-5}	

WSP	**Slug Test Analysis Report**	D-2
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-2	Test Well: OW16-2
Test Conducted by: SJD		Test Date: 30/06/2016
Analysis Performed by:	OW16-2 Rising Head Test	Analysis Date: 11/08/2016
Aquifer Thickness: 2.88 m		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
OW16-2	1.47×10^{-5}	

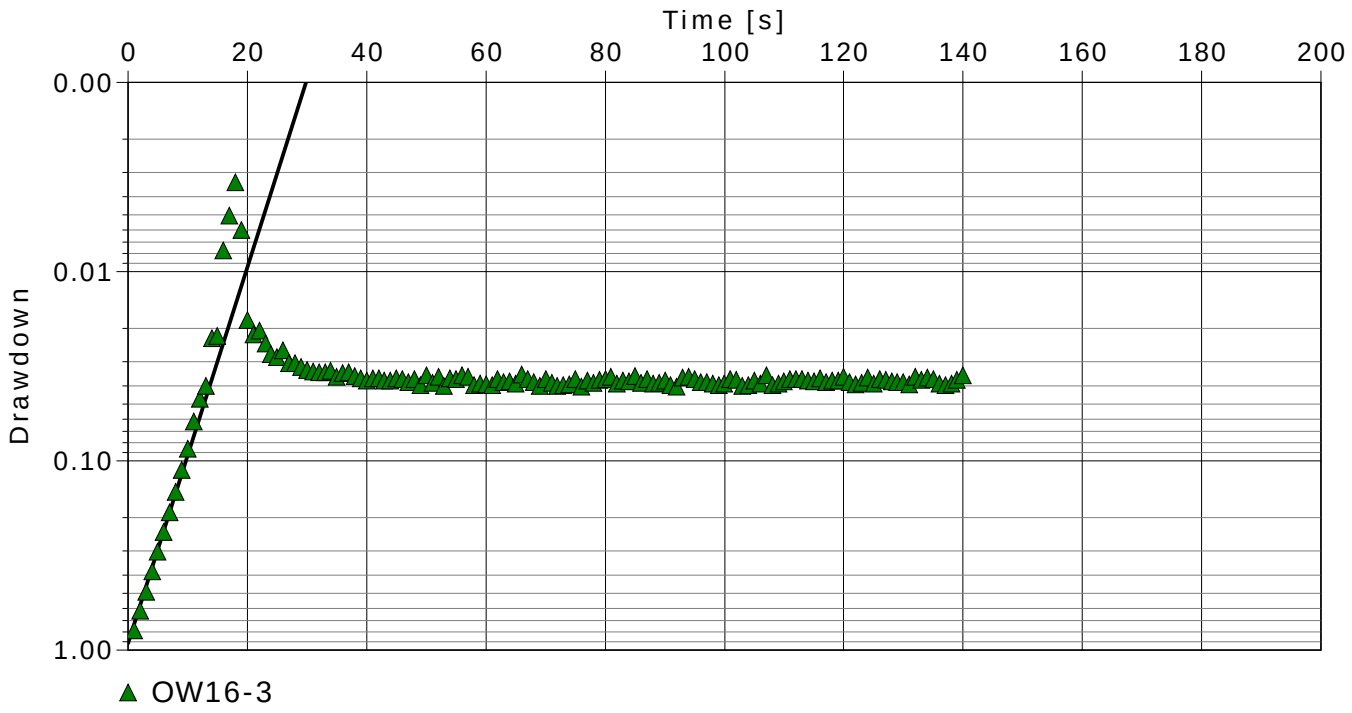
WSP	**Slug Test - Analyses Report**	D-2
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-2	Test Well: OW16-2
Test Conducted by: SJD		Test Date: 30/06/2016
Aquifer Thickness: 2.88 m		

	Analysis Name	Analysis Performed b	Analysis Date	Method name	Well	T [m²/s]	K [m/s]	S
1	OW16-2 Rising Head Test		11/08/2016	Hvorslev	OW16-2		1.47×10^{-5}	

WSP	**Slug Test Analysis Report**	D-3
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-3	Test Well: OW16-3
Test Conducted by: SJD		Test Date: 30/06/2016
Analysis Performed by: SJD	OW16-3 Rising Head	Analysis Date: 11/08/2016
Aquifer Thickness: 4.36 m		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
OW16-3	1.17×10^{-4}	

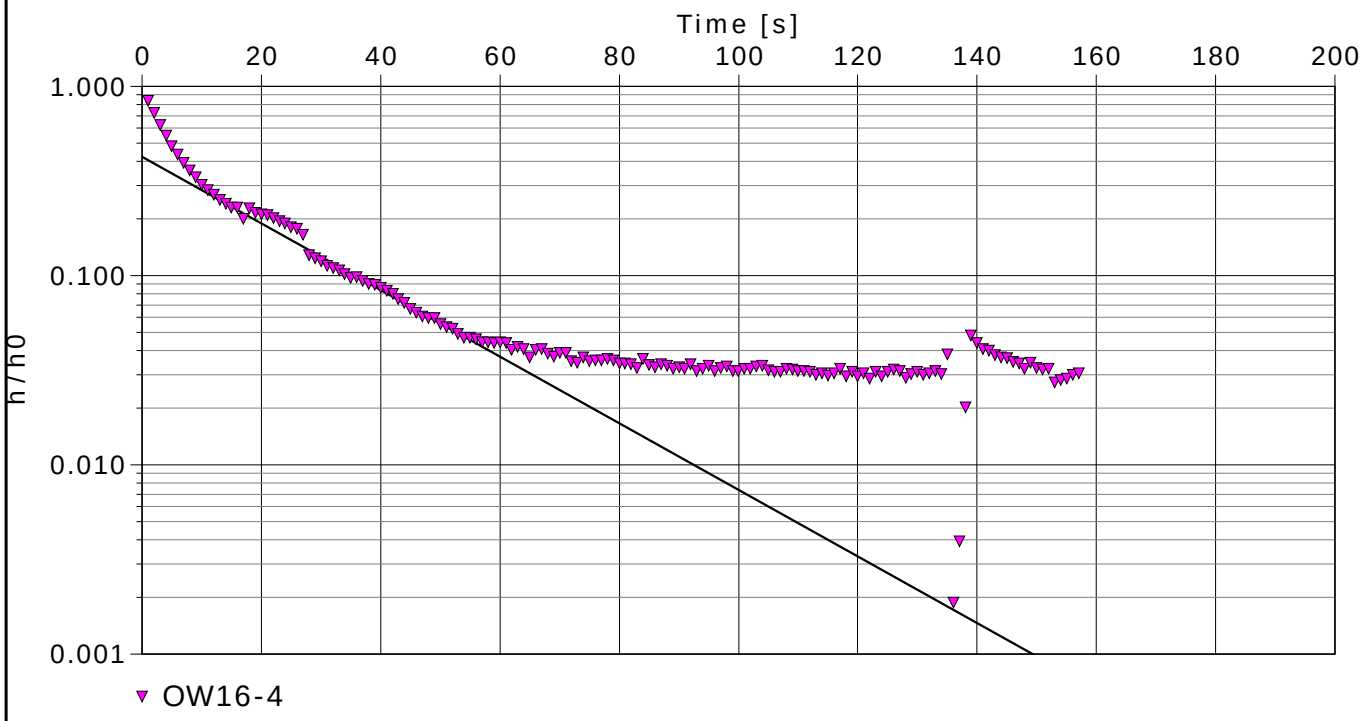
WSP	**Slug Test - Analyses Report**	D-3
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-3	Test Well: OW16-3
Test Conducted by: SJD		Test Date: 30/06/2016
Aquifer Thickness: 4.36 m		

	Analysis Name	Analysis Performed b	Analysis Date	Method name	Well	T [m²/s]	K [m/s]	S
1	OW16-3 Rising Head	SJD	11/08/2016	Hvorslev	OW16-3		1.17×10^{-4}	

WSP	**Slug Test Analysis Report**	D-4
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-4	Test Well: OW16-4
Test Conducted by: SJD		Test Date: 30/06/2016
Analysis Performed by: SJD	OW16-4 Rising Head	Analysis Date: 11/08/2016
Aquifer Thickness: 3.01 m		

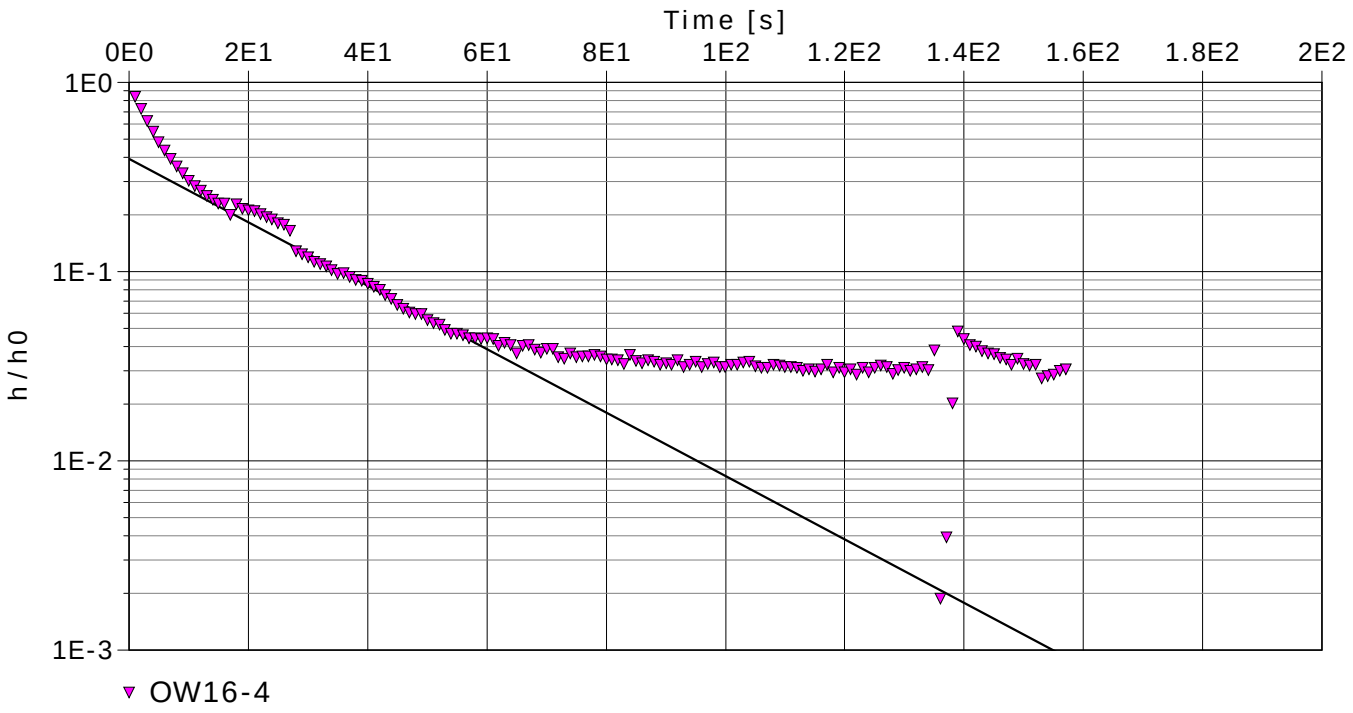


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
OW16-4	2.10×10^{-5}	

WSP	**Slug Test Analysis Report**	D-4
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-4	Test Well: OW16-4
Test Conducted by: SJD		Test Date: 30/06/2016
Analysis Performed by: SJD	OW16-4	Analysis Date: 11/08/2016
Aquifer Thickness: 3.01 m		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
OW16-4	2.00×10^{-5}	

Slug Test - Analyses Report D-4

Project: 5426, 5452 & 5584 Lakeshore Rd.

Number: 161-06960-00

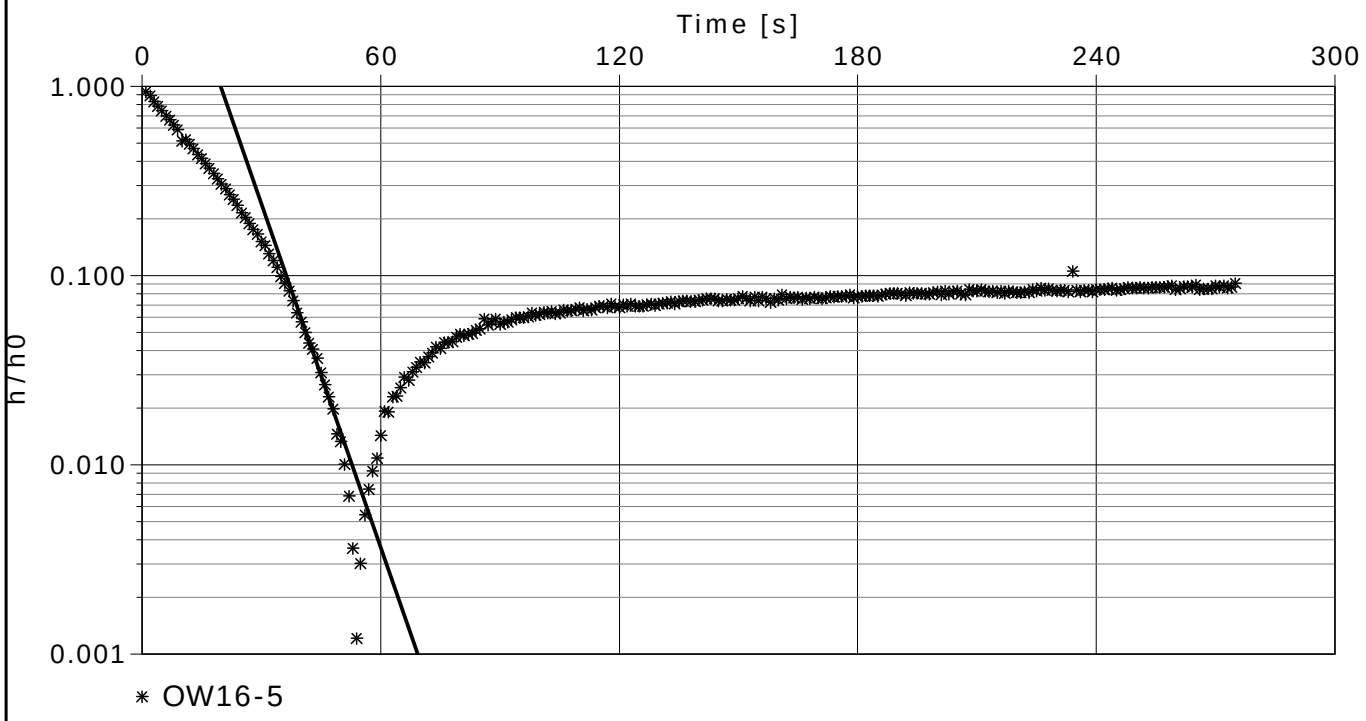
Client: Far Sight Homes

Location: Ballantrae, ON	Slug Test: OW16-4	Test Well: OW16-4
Test Conducted by: SJD		Test Date: 30/06/2016
Aquifer Thickness: 3.01 m		

	Analysis Name	Analysis Performed b	Analysis Date	Method name	Well	T [m²/s]	K [m/s]	S
1	OW16-4 Rising Head	SJD	11/08/2016	Hvorslev	OW16-4		2.10×10^{-5}	
2	OW16-4	SJD	11/08/2016	Hvorslev	OW16-4		2.00×10^{-5}	

WSP	**Slug Test Analysis Report**	D-5
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-5	Test Well: OW16-5
Test Conducted by: SJD		Test Date: 30/06/2016
Analysis Performed by: SJD	OW16-5 Rising Head	Analysis Date: 12/08/2016
Aquifer Thickness: 2.56 m		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
OW16-5	8.20×10^{-5}	

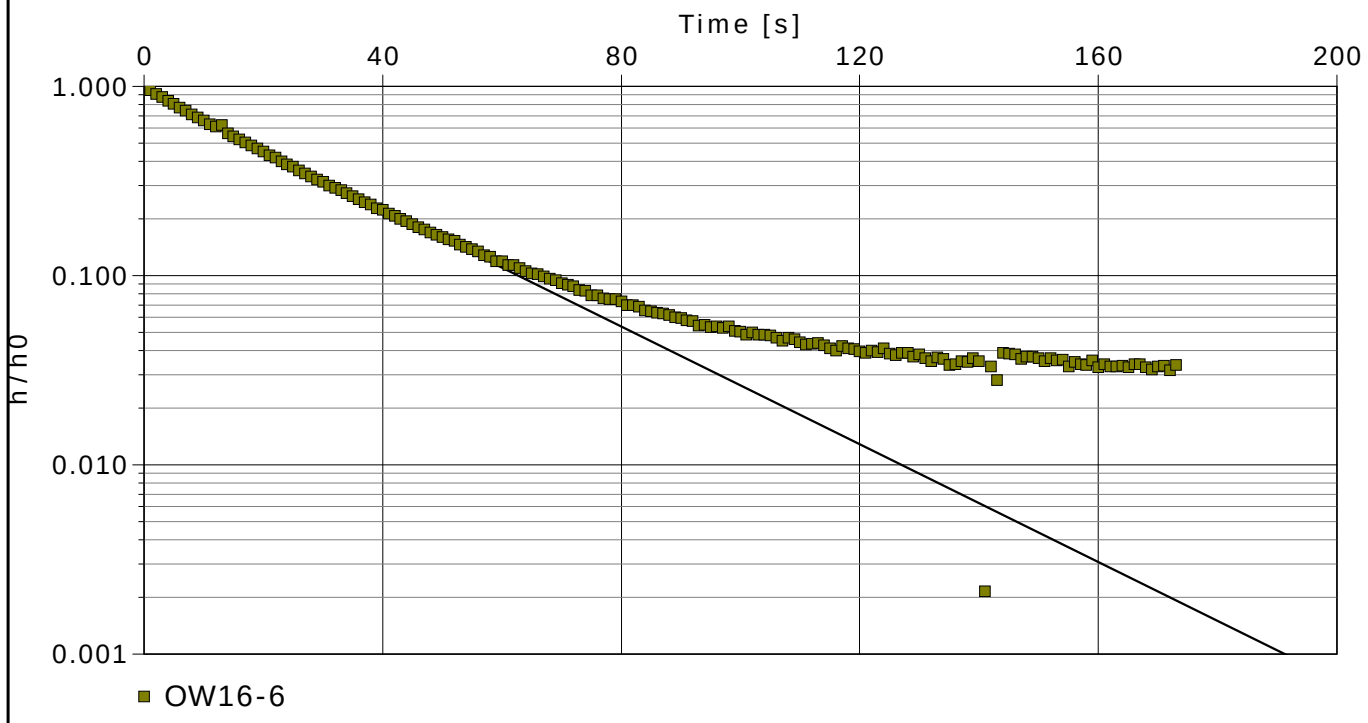
WSP	**Slug Test - Analyses Report**	D-5
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-5	Test Well: OW16-5
Test Conducted by: SJD		Test Date: 30/06/2016
Aquifer Thickness: 2.56 m		

	Analysis Name	Analysis Performed b	Analysis Date	Method name	Well	T [m²/s]	K [m/s]	S
1	OW16-5 Rising Head	SJD	12/08/2016	Hvorslev	OW16-5		8.20×10^{-5}	

WSP	**Slug Test Analysis Report**	D-6
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-6	Test Well: OW16-6
Test Conducted by: SJD		Test Date: 30/06/2016
Analysis Performed by: SJD	OW16-6 Rising Head	Analysis Date: 12/08/2016
Aquifer Thickness: 3.87 m		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
OW16-6	1.84×10^{-5}	

WSP	**Slug Test - Analyses Report**	D-6
	Project: 5426, 5452 & 5584 Lakeshore Rd.	
	Number: 161-06960-00	
	Client: Far Sight Homes	

Location: Ballantrae, ON	Slug Test: OW16-6	Test Well: OW16-6
Test Conducted by: SJD		Test Date: 30/06/2016
Aquifer Thickness: 3.87 m		

	Analysis Name	Analysis Performed b	Analysis Date	Method name	Well	T [m²/s]	K [m/s]	S
1	OW16-6 Rising Head	SJD	12/08/2016	Hvorslev	OW16-6		1.84×10^{-5}	

APPENDIX

G WATER QUALITY

Your Project #: 161-06960-00 /105
Site#: Farsight Development
Your C.O.C. #: 567024-01-01

Attention:Tanya Kizovski

WSP Canada Inc
126 Don Hillock Dr
Unit 2
Aurora, ON
L4G 0G9

Report Date: 2016/07/08
Report #: R4056908
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6D6032
Received: 2016/07/02, 09:10

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	7	N/A	2016/07/04	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	7	N/A	2016/07/05	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	7	N/A	2016/07/05	CAM SOP-00463	EPA 325.2 m
Conductivity	7	N/A	2016/07/04	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	7	N/A	2016/07/06	CAM SOP-00446	SM 22 5310 B m
Hardness (calculated as CaCO3)	7	N/A	2016/07/07	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals Analysis by ICP	5	2016/07/04	2016/07/06	CAM SOP-00408	EPA 6010C m
Dissolved Metals Analysis by ICP	2	2016/07/08	2016/07/08	CAM SOP-00408	EPA 6010C m
Ion Balance (% Difference)	7	N/A	2016/07/07		
Anion and Cation Sum	7	N/A	2016/07/07		
Total Ammonia-N	7	N/A	2016/07/07	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	7	N/A	2016/07/05	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	7	N/A	2016/07/04	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	7	N/A	2016/07/05	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	7	N/A	2016/07/07		
Sat. pH and Langelier Index (@ 4C)	7	N/A	2016/07/07		
Sulphate by Automated Colourimetry	7	N/A	2016/07/05	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	7	N/A	2016/07/07		

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: 161-06960-00 /105
Site#: Farsight Development
Your C.O.C. #: 567024-01-01

Attention:Tanya Kizovski

WSP Canada Inc
126 Don Hillock Dr
Unit 2
Aurora, ON
L4G 0G9

Report Date: 2016/07/08
Report #: R4056908
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6D6032
Received: 2016/07/02, 09:10

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ashton Gibson, Project Manager
Email: AGibson@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

RCAP - ROUTINE (WATER)

Maxxam ID		CQE362		CQE363		CQE364		
Sampling Date		2016/06/30		2016/06/30		2016/06/30		
COC Number		567024-01-01		567024-01-01		567024-01-01		
	UNITS	OW1	RDL	OW2	RDL	OW3	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	7.88	N/A	5.65	N/A	7.77	N/A	4562949
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	250	1.0	180	1.0	320	1.0	4562947
Calculated TDS	mg/L	440	1.0	350	1.0	430	1.0	4562952
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.0	1.0	1.4	1.0	2.1	1.0	4562947
Cation Sum	me/L	8.50	N/A	6.21	N/A	8.49	N/A	4562949
Hardness (CaCO3)	mg/L	290	1.0	300	1.0	370	1.0	4562897
Ion Balance (% Difference)	%	3.75	N/A	4.73	N/A	4.42	N/A	4562948
Langelier Index (@ 20C)	N/A	0.916		0.817		1.03		4562950
Langelier Index (@ 4C)	N/A	0.668		0.569		0.786		4562951
Saturation pH (@ 20C)	N/A	7.02		7.11		6.81		4562950
Saturation pH (@ 4C)	N/A	7.27		7.36		7.06		4562951
Inorganics								
Total Ammonia-N	mg/L	0.30	0.050	0.097	0.050	0.082	0.050	4564251
Conductivity	umho/cm	780	1.0	570	1.0	750	1.0	4563944
Dissolved Organic Carbon	mg/L	3.3	0.20	3.0	0.20	1.8	0.20	4563558
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010	4563634
pH	pH	7.94		7.93		7.84		4563946
Dissolved Sulphate (SO4)	mg/L	10	1.0	16	1.0	13	1.0	4563635
Alkalinity (Total as CaCO3)	mg/L	250	1.0	180	1.0	320	1.0	4563947
Dissolved Chloride (Cl)	mg/L	93	1.0	24	1.0	38	1.0	4563631
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	0.141	0.010	4564993
Nitrate (N)	mg/L	<0.10	0.10	15.0	0.50	0.37	0.10	4564993
Metals								
Dissolved Calcium (Ca)	mg/L	110	0.05	120	0.05	140	0.05	4563880
Dissolved Copper (Cu)	mg/L	<0.02	0.02	<0.02	0.02	<0.02	0.02	4563880
Dissolved Iron (Fe)	mg/L	0.16	0.02	<0.02	0.02	0.31	0.02	4563880
Dissolved Magnesium (Mg)	mg/L	4.7	0.05	2.8	0.05	5.5	0.05	4563880
Dissolved Manganese (Mn)	mg/L	0.39	0.01	0.03	0.01	0.65	0.01	4563880
Dissolved Potassium (K)	mg/L	3	1	3	1	4	1	4563880
Dissolved Sodium (Na)	mg/L	61	0.5	2.2	0.5	24	0.5	4563880
Dissolved Zinc (Zn)	mg/L	<0.01	0.01	<0.01	0.01	0.01	0.01	4563880

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6D6032
Report Date: 2016/07/08

WSP Canada Inc
Client Project #: 161-06960-00 /105

RCAP - ROUTINE (WATER)

Maxxam ID		CQE365	CQE365			CQE366	CQE366		
Sampling Date		2016/06/30	2016/06/30			2016/06/30	2016/06/30		
COC Number		567024-01-01	567024-01-01			567024-01-01	567024-01-01		
	UNITS	OW4	OW4 Lab-Dup	RDL	QC Batch	OW5	OW5 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	5.02		N/A	4562949	5.06		N/A	4562949
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	160		1.0	4562947	240		1.0	4562947
Calculated TDS	mg/L	320		1.0	4562952	280		1.0	4562952
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.8		1.0	4562947	1.9		1.0	4562947
Cation Sum	me/L	6.16		N/A	4562949	5.72		N/A	4562949
Hardness (CaCO3)	mg/L	290		1.0	4562897	280		1.0	4562897
Ion Balance (% Difference)	%	10.2		N/A	4562948	6.12		N/A	4562948
Langelier Index (@ 20C)	N/A	0.876			4562950	0.913			4562950
Langelier Index (@ 4C)	N/A	0.627			4562951	0.663			4562951
Saturation pH (@ 20C)	N/A	7.18			4562950	7.01			4562950
Saturation pH (@ 4C)	N/A	7.43			4562951	7.26			4562951
Inorganics									
Total Ammonia-N	mg/L	0.49		0.050	4564251	<0.050		0.050	4564251
Conductivity	umho/cm	490		1.0	4563944	470		1.0	4563944
Dissolved Organic Carbon	mg/L	1.7		0.20	4565985	1.9		0.20	4563558
Orthophosphate (P)	mg/L	<0.010	<0.010	0.010	4564031	<0.010		0.010	4563634
pH	pH	8.06			4563946	7.92			4563946
Dissolved Sulphate (SO4)	mg/L	20	20	1.0	4564022	6.1		1.0	4563635
Alkalinity (Total as CaCO3)	mg/L	170		1.0	4563947	240		1.0	4563947
Dissolved Chloride (Cl)	mg/L	7.3	7.3	1.0	4564030	3.8		1.0	4563631
Nitrite (N)	mg/L	0.065		0.010	4563649	<0.010		0.010	4564993
Nitrate (N)	mg/L	14.8		0.50	4563649	0.60		0.10	4564993
Metals									
Dissolved Calcium (Ca)	mg/L	110		0.05	4563880	110	110	0.05	4563880
Dissolved Copper (Cu)	mg/L	<0.02		0.02	4563880	<0.02	<0.02	0.02	4563880
Dissolved Iron (Fe)	mg/L	<0.02		0.02	4563880	<0.02	0.02	0.02	4563880
Dissolved Magnesium (Mg)	mg/L	7.1		0.05	4563880	3.6	3.6	0.05	4563880
Dissolved Manganese (Mn)	mg/L	0.12		0.01	4563880	0.02	0.02	0.01	4563880
Dissolved Potassium (K)	mg/L	4		1	4563880	<1	<1	1	4563880
Dissolved Sodium (Na)	mg/L	3.3		0.5	4563880	2.5	2.5	0.5	4563880
Dissolved Zinc (Zn)	mg/L	<0.01		0.01	4563880	<0.01	<0.01	0.01	4563880

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

RCAP - ROUTINE (WATER)

Maxxam ID		CQE367	CQE368		
Sampling Date		2016/06/30	2016/06/30		
COC Number		567024-01-01	567024-01-01		
	UNITS	OW6	DUP	RDL	QC Batch
Calculated Parameters					
Anion Sum	me/L	10.4	9.89	N/A	4562949
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	280	270	1.0	4562947
Calculated TDS	mg/L	640	610	1.0	4562952
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.0	2.2	1.0	4562947
Cation Sum	me/L	14.0	13.4	N/A	4562949
Hardness (CaCO3)	mg/L	470	450	1.0	4562897
Ion Balance (% Difference)	%	14.8	15.2	N/A	4562948
Langelier Index (@ 20C)	N/A	1.07	1.11		4562950
Langelier Index (@ 4C)	N/A	0.825	0.858		4562951
Saturation pH (@ 20C)	N/A	6.80	6.82		4562950
Saturation pH (@ 4C)	N/A	7.05	7.07		4562951
Inorganics					
Total Ammonia-N	mg/L	0.088	<0.050	0.050	4564251
Conductivity	umho/cm	1100	1000	1.0	4563944
Dissolved Organic Carbon	mg/L	4.8	4.9	0.20	4563558
Orthophosphate (P)	mg/L	<0.010	<0.010	0.010	4563634
pH	pH	7.87	7.93		4563946
Dissolved Sulphate (SO4)	mg/L	15	14	1.0	4563635
Alkalinity (Total as CaCO3)	mg/L	290	280	1.0	4563947
Dissolved Chloride (Cl)	mg/L	160	140	2.0	4563631
Nitrite (N)	mg/L	<0.010	<0.010	0.010	4564993
Nitrate (N)	mg/L	<0.10	<0.10	0.10	4564993
Metals					
Dissolved Calcium (Ca)	mg/L	170	170	0.05	4569777
Dissolved Copper (Cu)	mg/L	<0.02	<0.02	0.02	4569777
Dissolved Iron (Fe)	mg/L	0.65	0.52	0.02	4569777
Dissolved Magnesium (Mg)	mg/L	7.4	7.1	0.05	4569777
Dissolved Manganese (Mn)	mg/L	0.15	0.14	0.01	4569777
Dissolved Potassium (K)	mg/L	1	1	1	4569777
Dissolved Sodium (Na)	mg/L	110	100	0.5	4569777
Dissolved Zinc (Zn)	mg/L	<0.01	<0.01	0.01	4569777

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6D6032
Report Date: 2016/07/08

WSP Canada Inc
Client Project #: 161-06960-00 /105

TEST SUMMARY

Maxxam ID: CQE362
Sample ID: OW1
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4563947	N/A	2016/07/04	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4562947	N/A	2016/07/05	Automated Statchk
Chloride by Automated Colourimetry	KONE	4563631	N/A	2016/07/05	Deonarine Ramnarine
Conductivity	AT	4563944	N/A	2016/07/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4563558	N/A	2016/07/06	Elsamma Alex
Hardness (calculated as CaCO3)		4562897	N/A	2016/07/07	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4563880	2016/07/04	2016/07/06	Azita Fazaeli
Ion Balance (% Difference)	CALC	4562948	N/A	2016/07/07	Automated Statchk
Anion and Cation Sum	CALC	4562949	N/A	2016/07/07	Automated Statchk
Total Ammonia-N	LACH/NH4	4564251	N/A	2016/07/07	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4564993	N/A	2016/07/05	Chandra Nandlal
pH	AT	4563946	N/A	2016/07/04	Surinder Rai
Orthophosphate	KONE	4563634	N/A	2016/07/05	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4562950	N/A	2016/07/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4562951	N/A	2016/07/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4563635	N/A	2016/07/05	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4562952	N/A	2016/07/07	Automated Statchk

Maxxam ID: CQE363
Sample ID: OW2
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4563947	N/A	2016/07/04	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4562947	N/A	2016/07/05	Automated Statchk
Chloride by Automated Colourimetry	KONE	4563631	N/A	2016/07/05	Deonarine Ramnarine
Conductivity	AT	4563944	N/A	2016/07/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4563558	N/A	2016/07/06	Elsamma Alex
Hardness (calculated as CaCO3)		4562897	N/A	2016/07/07	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4563880	2016/07/04	2016/07/06	Azita Fazaeli
Ion Balance (% Difference)	CALC	4562948	N/A	2016/07/07	Automated Statchk
Anion and Cation Sum	CALC	4562949	N/A	2016/07/07	Automated Statchk
Total Ammonia-N	LACH/NH4	4564251	N/A	2016/07/07	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4564993	N/A	2016/07/05	Chandra Nandlal
pH	AT	4563946	N/A	2016/07/04	Surinder Rai
Orthophosphate	KONE	4563634	N/A	2016/07/05	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4562950	N/A	2016/07/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4562951	N/A	2016/07/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4563635	N/A	2016/07/05	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4562952	N/A	2016/07/07	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6D6032
Report Date: 2016/07/08

WSP Canada Inc
Client Project #: 161-06960-00 /105

TEST SUMMARY

Maxxam ID: CQE364
Sample ID: OW3
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4563947	N/A	2016/07/04	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4562947	N/A	2016/07/05	Automated Statchk
Chloride by Automated Colourimetry	KONE	4563631	N/A	2016/07/05	Deonarine Ramnarine
Conductivity	AT	4563944	N/A	2016/07/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4563558	N/A	2016/07/06	Elsamma Alex
Hardness (calculated as CaCO3)		4562897	N/A	2016/07/07	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4563880	2016/07/04	2016/07/06	Azita Fazaeli
Ion Balance (% Difference)	CALC	4562948	N/A	2016/07/07	Automated Statchk
Anion and Cation Sum	CALC	4562949	N/A	2016/07/07	Automated Statchk
Total Ammonia-N	LACH/NH4	4564251	N/A	2016/07/07	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4564993	N/A	2016/07/05	Chandra Nandlal
pH	AT	4563946	N/A	2016/07/04	Surinder Rai
Orthophosphate	KONE	4563634	N/A	2016/07/05	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4562950	N/A	2016/07/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4562951	N/A	2016/07/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4563635	N/A	2016/07/05	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4562952	N/A	2016/07/07	Automated Statchk

Maxxam ID: CQE365
Sample ID: OW4
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4563947	N/A	2016/07/04	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4562947	N/A	2016/07/05	Automated Statchk
Chloride by Automated Colourimetry	KONE	4564030	N/A	2016/07/05	Deonarine Ramnarine
Conductivity	AT	4563944	N/A	2016/07/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4565985	N/A	2016/07/06	Elsamma Alex
Hardness (calculated as CaCO3)		4562897	N/A	2016/07/07	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4563880	2016/07/04	2016/07/06	Azita Fazaeli
Ion Balance (% Difference)	CALC	4562948	N/A	2016/07/07	Automated Statchk
Anion and Cation Sum	CALC	4562949	N/A	2016/07/07	Automated Statchk
Total Ammonia-N	LACH/NH4	4564251	N/A	2016/07/07	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4563649	N/A	2016/07/05	Chandra Nandlal
pH	AT	4563946	N/A	2016/07/04	Surinder Rai
Orthophosphate	KONE	4564031	N/A	2016/07/05	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4562950	N/A	2016/07/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4562951	N/A	2016/07/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4564022	N/A	2016/07/05	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4562952	N/A	2016/07/07	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6D6032
Report Date: 2016/07/08

WSP Canada Inc
Client Project #: 161-06960-00 /105

TEST SUMMARY

Maxxam ID: CQE365 Dup
Sample ID: OW4
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	4564030	N/A	2016/07/05	Deonarine Ramnarine
Orthophosphate	KONE	4564031	N/A	2016/07/05	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4564022	N/A	2016/07/05	Deonarine Ramnarine

Maxxam ID: CQE366
Sample ID: OW5
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4563947	N/A	2016/07/04	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4562947	N/A	2016/07/05	Automated Statchk
Chloride by Automated Colourimetry	KONE	4563631	N/A	2016/07/05	Deonarine Ramnarine
Conductivity	AT	4563944	N/A	2016/07/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4563558	N/A	2016/07/06	Elsamma Alex
Hardness (calculated as CaCO3)		4562897	N/A	2016/07/07	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4563880	2016/07/04	2016/07/06	Azita Fazaeli
Ion Balance (% Difference)	CALC	4562948	N/A	2016/07/07	Automated Statchk
Anion and Cation Sum	CALC	4562949	N/A	2016/07/07	Automated Statchk
Total Ammonia-N	LACH/NH4	4564251	N/A	2016/07/07	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4564993	N/A	2016/07/05	Chandra Nandlal
pH	AT	4563946	N/A	2016/07/04	Surinder Rai
Orthophosphate	KONE	4563634	N/A	2016/07/05	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4562950	N/A	2016/07/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4562951	N/A	2016/07/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4563635	N/A	2016/07/05	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4562952	N/A	2016/07/07	Automated Statchk

Maxxam ID: CQE366 Dup
Sample ID: OW5
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals Analysis by ICP	ICP	4563880	2016/07/04	2016/07/06	Azita Fazaeli

Maxxam ID: CQE367
Sample ID: OW6
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4563947	N/A	2016/07/04	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4562947	N/A	2016/07/05	Automated Statchk
Chloride by Automated Colourimetry	KONE	4563631	N/A	2016/07/05	Deonarine Ramnarine
Conductivity	AT	4563944	N/A	2016/07/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4563558	N/A	2016/07/06	Elsamma Alex
Hardness (calculated as CaCO3)		4562897	N/A	2016/07/07	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4569777	2016/07/08	2016/07/08	Azita Fazaeli

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6D6032
Report Date: 2016/07/08

WSP Canada Inc
Client Project #: 161-06960-00 /105

TEST SUMMARY

Maxxam ID: CQE367
Sample ID: OW6
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ion Balance (% Difference)	CALC	4562948	N/A	2016/07/07	Automated Statchk
Anion and Cation Sum	CALC	4562949	N/A	2016/07/07	Automated Statchk
Total Ammonia-N	LACH/NH4	4564251	N/A	2016/07/07	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4564993	N/A	2016/07/05	Chandra Nandlal
pH	AT	4563946	N/A	2016/07/04	Surinder Rai
Orthophosphate	KONE	4563634	N/A	2016/07/05	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4562950	N/A	2016/07/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4562951	N/A	2016/07/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4563635	N/A	2016/07/05	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4562952	N/A	2016/07/07	Automated Statchk

Maxxam ID: CQE368
Sample ID: DUP
Matrix: Water

Collected: 2016/06/30
Shipped:
Received: 2016/07/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4563947	N/A	2016/07/04	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4562947	N/A	2016/07/05	Automated Statchk
Chloride by Automated Colourimetry	KONE	4563631	N/A	2016/07/05	Deonarine Ramnarine
Conductivity	AT	4563944	N/A	2016/07/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4563558	N/A	2016/07/06	Elsamma Alex
Hardness (calculated as CaCO3)		4562897	N/A	2016/07/07	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4569777	2016/07/08	2016/07/08	Azita Fazaeli
Ion Balance (% Difference)	CALC	4562948	N/A	2016/07/07	Automated Statchk
Anion and Cation Sum	CALC	4562949	N/A	2016/07/07	Automated Statchk
Total Ammonia-N	LACH/NH4	4564251	N/A	2016/07/07	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4564993	N/A	2016/07/05	Chandra Nandlal
pH	AT	4563946	N/A	2016/07/04	Surinder Rai
Orthophosphate	KONE	4563634	N/A	2016/07/05	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4562950	N/A	2016/07/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4562951	N/A	2016/07/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4563635	N/A	2016/07/05	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4562952	N/A	2016/07/07	Automated Statchk

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.3°C

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4563558	EAX	Matrix Spike	Dissolved Organic Carbon	2016/07/06		105	%	80 - 120
4563558	EAX	Spiked Blank	Dissolved Organic Carbon	2016/07/06		100	%	80 - 120
4563558	EAX	Method Blank	Dissolved Organic Carbon	2016/07/06	<0.20		mg/L	
4563558	EAX	RPD	Dissolved Organic Carbon	2016/07/06	0.44		%	20
4563631	DRM	Matrix Spike	Dissolved Chloride (Cl)	2016/07/05		NC	%	80 - 120
4563631	DRM	Spiked Blank	Dissolved Chloride (Cl)	2016/07/05		101	%	80 - 120
4563631	DRM	Method Blank	Dissolved Chloride (Cl)	2016/07/05	<1.0		mg/L	
4563631	DRM	RPD	Dissolved Chloride (Cl)	2016/07/05	2.2		%	20
4563634	ADB	Matrix Spike	Orthophosphate (P)	2016/07/05		98	%	75 - 125
4563634	ADB	Spiked Blank	Orthophosphate (P)	2016/07/05		101	%	80 - 120
4563634	ADB	Method Blank	Orthophosphate (P)	2016/07/05	<0.010		mg/L	
4563634	ADB	RPD	Orthophosphate (P)	2016/07/05	NC		%	25
4563635	DRM	Matrix Spike	Dissolved Sulphate (SO4)	2016/07/05		NC	%	75 - 125
4563635	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2016/07/05		105	%	80 - 120
4563635	DRM	Method Blank	Dissolved Sulphate (SO4)	2016/07/05	<1.0		mg/L	
4563635	DRM	RPD	Dissolved Sulphate (SO4)	2016/07/05	0.29		%	20
4563649	C_N	Matrix Spike	Nitrite (N)	2016/07/05		97	%	80 - 120
			Nitrate (N)	2016/07/05		94	%	80 - 120
4563649	C_N	Spiked Blank	Nitrite (N)	2016/07/05		99	%	80 - 120
			Nitrate (N)	2016/07/05		105	%	80 - 120
4563649	C_N	Method Blank	Nitrite (N)	2016/07/05	<0.010		mg/L	
			Nitrate (N)	2016/07/05	<0.10		mg/L	
4563649	C_N	RPD	Nitrite (N)	2016/07/05	NC		%	25
			Nitrate (N)	2016/07/05	0.46		%	25
4563880	AFZ	Matrix Spike [CQE366-03]	Dissolved Calcium (Ca)	2016/07/06		NC	%	80 - 120
			Dissolved Copper (Cu)	2016/07/06		108	%	80 - 120
			Dissolved Iron (Fe)	2016/07/06		109	%	80 - 120
			Dissolved Magnesium (Mg)	2016/07/06		104	%	80 - 120
			Dissolved Manganese (Mn)	2016/07/06		108	%	80 - 120
			Dissolved Potassium (K)	2016/07/06		108	%	80 - 120
			Dissolved Sodium (Na)	2016/07/06		110	%	80 - 120
			Dissolved Zinc (Zn)	2016/07/06		109	%	80 - 120
4563880	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2016/07/06		106	%	80 - 120
			Dissolved Copper (Cu)	2016/07/06		105	%	80 - 120
			Dissolved Iron (Fe)	2016/07/06		108	%	80 - 120
			Dissolved Magnesium (Mg)	2016/07/06		103	%	80 - 120
			Dissolved Manganese (Mn)	2016/07/06		107	%	80 - 120
			Dissolved Potassium (K)	2016/07/06		105	%	80 - 120
			Dissolved Sodium (Na)	2016/07/06		107	%	80 - 120
			Dissolved Zinc (Zn)	2016/07/06		107	%	80 - 120
4563880	AFZ	Method Blank	Dissolved Calcium (Ca)	2016/07/06	<0.05		mg/L	
			Dissolved Copper (Cu)	2016/07/06	<0.02		mg/L	
			Dissolved Iron (Fe)	2016/07/06	<0.02		mg/L	
			Dissolved Magnesium (Mg)	2016/07/06	<0.05		mg/L	
			Dissolved Manganese (Mn)	2016/07/06	<0.01		mg/L	
			Dissolved Potassium (K)	2016/07/06	<1		mg/L	
			Dissolved Sodium (Na)	2016/07/06	<0.5		mg/L	
			Dissolved Zinc (Zn)	2016/07/06	<0.01		mg/L	
4563880	AFZ	RPD [CQE366-03]	Dissolved Calcium (Ca)	2016/07/06	0.75		%	25
			Dissolved Copper (Cu)	2016/07/06	NC		%	25
			Dissolved Iron (Fe)	2016/07/06	NC		%	25
			Dissolved Magnesium (Mg)	2016/07/06	0.084		%	25
			Dissolved Manganese (Mn)	2016/07/06	NC		%	25
			Dissolved Potassium (K)	2016/07/06	NC		%	25

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2016/07/06	0.12		%	25
			Dissolved Zinc (Zn)	2016/07/06	NC		%	25
4563944	SAU	Spiked Blank	Conductivity	2016/07/04		99	%	85 - 115
4563944	SAU	Method Blank	Conductivity	2016/07/04	<1.0		umho/c	
4563944	SAU	RPD	Conductivity	2016/07/04	0.33		%	25
4563946	SAU	Spiked Blank	pH	2016/07/04		101	%	98 - 103
4563946	SAU	RPD	pH	2016/07/04	0.81		%	N/A
4563947	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2016/07/04		98	%	85 - 115
4563947	SAU	Method Blank	Alkalinity (Total as CaCO3)	2016/07/04	<1.0		mg/L	
4563947	SAU	RPD	Alkalinity (Total as CaCO3)	2016/07/04	1.3		%	25
4564022	DRM	Matrix Spike [CQE365-01]	Dissolved Sulphate (SO4)	2016/07/05		NC	%	75 - 125
4564022	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2016/07/05		107	%	80 - 120
4564022	DRM	Method Blank	Dissolved Sulphate (SO4)	2016/07/05	<1.0		mg/L	
4564022	DRM	RPD [CQE365-01]	Dissolved Sulphate (SO4)	2016/07/05	0.070		%	20
4564030	DRM	Matrix Spike [CQE365-01]	Dissolved Chloride (Cl)	2016/07/05		103	%	80 - 120
4564030	DRM	Spiked Blank	Dissolved Chloride (Cl)	2016/07/05		101	%	80 - 120
4564030	DRM	Method Blank	Dissolved Chloride (Cl)	2016/07/05	<1.0		mg/L	
4564030	DRM	RPD [CQE365-01]	Dissolved Chloride (Cl)	2016/07/05	0.35		%	20
4564031	ADB	Matrix Spike [CQE365-01]	Orthophosphate (P)	2016/07/05		103	%	75 - 125
4564031	ADB	Spiked Blank	Orthophosphate (P)	2016/07/06		100	%	80 - 120
4564031	ADB	Method Blank	Orthophosphate (P)	2016/07/06	<0.010		mg/L	
4564031	ADB	RPD [CQE365-01]	Orthophosphate (P)	2016/07/05	NC		%	25
4564251	COP	Matrix Spike	Total Ammonia-N	2016/07/07		NC	%	80 - 120
4564251	COP	Spiked Blank	Total Ammonia-N	2016/07/07		100	%	85 - 115
4564251	COP	Method Blank	Total Ammonia-N	2016/07/07	<0.050		mg/L	
4564251	COP	RPD	Total Ammonia-N	2016/07/07	0.30		%	20
4564993	C_N	Matrix Spike	Nitrite (N)	2016/07/05		99	%	80 - 120
			Nitrate (N)	2016/07/05		103	%	80 - 120
4564993	C_N	Spiked Blank	Nitrite (N)	2016/07/05		100	%	80 - 120
			Nitrate (N)	2016/07/05		105	%	80 - 120
4564993	C_N	Method Blank	Nitrite (N)	2016/07/05	<0.010		mg/L	
			Nitrate (N)	2016/07/05	<0.10		mg/L	
4564993	C_N	RPD	Nitrite (N)	2016/07/05	NC		%	25
			Nitrate (N)	2016/07/05	NC		%	25
4565985	EAX	Matrix Spike	Dissolved Organic Carbon	2016/07/06		91	%	80 - 120
4565985	EAX	Spiked Blank	Dissolved Organic Carbon	2016/07/06		103	%	80 - 120
4565985	EAX	Method Blank	Dissolved Organic Carbon	2016/07/06	<0.20		mg/L	
4565985	EAX	RPD	Dissolved Organic Carbon	2016/07/06	NC		%	20
4569777	AFZ	Matrix Spike	Dissolved Calcium (Ca)	2016/07/08		NC	%	80 - 120
			Dissolved Copper (Cu)	2016/07/08		NC	%	80 - 120
			Dissolved Iron (Fe)	2016/07/08		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2016/07/08		NC	%	80 - 120
			Dissolved Manganese (Mn)	2016/07/08		NC	%	80 - 120
			Dissolved Potassium (K)	2016/07/08		NC	%	80 - 120
			Dissolved Sodium (Na)	2016/07/08		NC	%	80 - 120
			Dissolved Zinc (Zn)	2016/07/08		NC	%	80 - 120
4569777	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2016/07/08		96	%	80 - 120
			Dissolved Copper (Cu)	2016/07/08		93	%	80 - 120
			Dissolved Iron (Fe)	2016/07/08		94	%	80 - 120
			Dissolved Magnesium (Mg)	2016/07/08		97	%	80 - 120
			Dissolved Manganese (Mn)	2016/07/08		95	%	80 - 120
			Dissolved Potassium (K)	2016/07/08		97	%	80 - 120
			Dissolved Sodium (Na)	2016/07/08		94	%	80 - 120
			Dissolved Zinc (Zn)	2016/07/08		91	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4569777	AFZ	Method Blank	Dissolved Calcium (Ca)	2016/07/08	<0.05		mg/L	
			Dissolved Copper (Cu)	2016/07/08	<0.02		mg/L	
			Dissolved Iron (Fe)	2016/07/08	<0.02		mg/L	
			Dissolved Magnesium (Mg)	2016/07/08	<0.05		mg/L	
			Dissolved Manganese (Mn)	2016/07/08	<0.01		mg/L	
			Dissolved Potassium (K)	2016/07/08	<1		mg/L	
			Dissolved Sodium (Na)	2016/07/08	<0.5		mg/L	
			Dissolved Zinc (Zn)	2016/07/08	<0.01		mg/L	
4569777	AFZ	RPD	Dissolved Sodium (Na)	2016/07/08	0.99		%	25

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6D6032
Report Date: 2016/07/08

WSP Canada Inc
Client Project #: 161-06960-00 /105

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-Free:(800) 563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#1089 WSP Canada Inc	Company Name:	WSP	Quotation #:	B62738	Maxxam Job #:	Bottle Order #: 567024
Attention:	Accounts Payable	Attention:	Tanya Kizovski	P.O. #:			
Address:	126 Don Hillock Dr Unit 2 Aurora ON L4G 0G9	Address:		Project:	161-06960-00 /105		
Tel:	(905) 750-3080 x Fax: (905) 727-0463 x	Tel:	905-750-3080 x1663 Fax:	Project Name:		COC #: C#567024-01-01	Project Manager: Ashton Gibson
Email:	payables.ontario@wspgroup.com	Email:	tanya.kizovski@wspgroup.com	Site #:	Farsight Development		
				Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☒ Res/Park ☐ Medium/Fine ☒ Table 2 ☐ Ind/Comm ☒ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☒ PWQO ☐ Other ___	

Include Criteria on Certificate of Analysis (Y/N)? Y

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): RCAp - Routine	RCAP - Surface Water	# of Bottles	Comments
1		OW1	June 30/16	AM	GW	Y	X		4	
2		OW2	↓	↓	GW	↓	↓		↓	
3		OW3			GW					02-Jul-16 09:10 Ashton Gibson B6D6032 ASR ENV-698
4		OW4			GW					
5		OW5			GW					
6		OW6			GW					
7		DUP	↓	↓	GW	↓	↓		↓	
8					SW					
9					SW					
10										

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
	16/06/30	15:00		2016/07/02	09:10	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	9/9/10	Present		
		Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

APPENDIX

H CLIMATE BASED WATER BUDGET

TABLE H-1
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (KING SMOKE TREE CLIMATE STATION)
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

	Thornthwaite (1948)							
Month	**Mean Temperature (°C)**	**Heat Index**	**Potential Evapo-transpiration (mm)**	**Daylight Correction Value**	**Adjusted Potential Evapo-transpiration (mm)**	**Total Precipitation (mm)**	**Surplus (mm)**	**Deficit (mm)**
January	-7.4	0.0	0.0	0.7839	0.00	51.7	51.7	0.0
February	-6.1	0.0	0.0	0.8679	0.00	46	46.0	0.0
March	-1.5	0.0	0.0	0.9871	0.00	51.2	51.2	0.0
April	6	1.3	27.6	1.1200	30.88	64.9	34.0	0.0
May	12.5	4.0	60.4	1.2290	74.29	87.1	12.8	0.0
June	17.7	6.8	87.7	1.2900	113.11	84.8	0.0	28.3
July	20.5	8.5	102.6	1.2581	129.07	86.4	0.0	42.7
August	19.6	7.9	97.8	1.1613	113.55	88.4	0.0	25.2
September	15.3	5.4	75.0	1.0400	78.03	84.2	6.2	0.0
October	8.6	2.3	40.5	0.9194	37.25	72.9	35.6	0.0
November	2.3	0.3	9.7	0.8000	7.73	84.6	76.9	0.0
December	-3.7	0.0	0.0	0.7355	0.00	55.5	55.5	0.0
TOTALS		**36.5**			**583.9**	**857.7**	**369.9**	**96.1**

TOTAL WATER SURPLUS **273.8** **mm**

NOTES:

1) Water budget adjusted for latitude and daylight.

2) (°C) - Represents calculated mean of daily temperatures for the month.

3) Precipitation and Temperature data from the King Smoke Tree Station located at latitude 44°01'00.000" N, longitude 79°31'00.000" W, elevation 352.00.

4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.

5) Total Moisture Surplus (Thornthwaite and Mather, 1957) is calculated as total precipitation minus actual evapotranspiration.

TABLE H-2
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (KING SMOKE TREE CLIMATE STATION)
Silt Loam, Residential Lawn (125 mm HOLDING CAPACITY)
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

	Thornthwaite (1948)									Thornthwaite and Mather (1957)					
Month	Mean Temperature (°C)	Heat Index	Potential Evapo-transpiration (mm)	Daylight Correction Value	Adjusted Potential Evapo-transpiration (mm)	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)	TP - PET (mm)	Accumulated Potential Water Loss (mm)	Soil Moisture (mm)	Change in Soil Moisture (mm) (delta S)	Actual Evapo-transpiration (mm)	Moisture Deficit (mm)	Unadjusted Moisture Surplus (mm)
January	-7.4	0.0	0.0	0.7839	0.00	51.7	51.7	0.0	51.7	0.0	125.0	0.0	0.0	0.0	51.7
February	-6.1	0.0	0.0	0.8679	0.00	46.0	46.0	0.0	46.0	0.0	125.0	0.0	0.0	0.0	46.0
March	-1.5	0.0	0.0	0.9871	0.00	51.2	51.2	0.0	51.2	0.0	125.0	0.0	0.0	0.0	51.2
April	6.0	1.3	27.6	1.1200	30.88	64.9	34.0	0.0	34.0	0.0	125.0	0.0	30.9	0.0	34.0
May	12.5	4.0	60.4	1.2290	74.29	87.1	12.8	0.0	12.8	0.0	125.0	0.0	74.3	0.0	12.8
June	17.7	6.8	87.7	1.2900	113.11	84.8	0.0	28.3	-28.3	-28.3	99.0	-26.0	110.8	2.3	0.0
July	20.5	8.5	102.6	1.2581	129.07	86.4	0.0	42.7	-42.7	-71.0	70.0	-29.0	115.4	13.7	0.0
August	19.6	7.9	97.8	1.1613	113.55	88.4	0.0	25.2	-25.2	-96.1	57.0	-13.0	101.4	12.2	0.0
September	15.3	5.4	75.0	1.0400	78.03	84.2	6.2	0.0	6.2	0.0	63.2	6.2	78.0	0.0	0.0
October	8.6	2.3	40.5	0.9194	37.25	72.9	35.6	0.0	35.6	0.0	98.8	35.6	37.3	0.0	0.0
November	2.3	0.3	9.7	0.8000	7.73	84.6	76.9	0.0	76.9	0.0	125.0	26.2	7.7	0.0	50.7
December	-3.7	0.0	0.0	0.7355	0.00	55.5	55.5	0.0	55.5	0.0	125.0	0.0	0.0	0.0	55.5
TOTALS		**36.5**			**583.9**	**857.7**	**369.9**	**96.1**	**273.8**	**-96.1**	**1263.0**	**0.0**	**555.8**	**28.1**	**301.9**

TOTAL WATER SURPLUS **273.8** **mm**

TOTAL MOISTURE SURPLUS **301.9** **mm**

NOTES:

1) Water budget adjusted for latitude and daylight.

2) (°C) - Represents calculated mean of daily temperatures for the month.

3) Precipitation and Temperature data from the King Smoke Tree Station located at latitude 44°01'00.000" N, longitude 79°31'00.000" W, elevation 352.00.

4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.

5) Total Moisture Surplus (Thornthwaite and Mather, 1957) is calculated as total precipitation minus actual evapotranspiration.

TABLE H-3
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (KING SMOKE TREE CLIMATE STATION)
Silt Loam, Cultivated (200 mm HOLDING CAPACITY)
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

	Thornthwaite (1948)									Thornthwaite and Mather (1957)					
Month	Mean Temperature (°C)	Heat Index	Potential Evapo-transpiration (mm)	Daylight Correction Value	Adjusted Potential Evapo-transpiration (mm)	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)	TP - PET (mm)	Accumulated Potential Water Loss (mm)	Soil Moisture (mm)	Change in Soil Moisture (mm) (delta S)	Actual Evapo-transpiration (mm)	Moisture Deficit (mm)	Unadjusted Moisture Surplus (mm)
January	-7.4	0.0	0.0	0.7839	0.00	51.7	51.7	0.0	51.7	0.0	200.0	0.0	0.0	0.0	51.7
February	-6.1	0.0	0.0	0.8679	0.00	46.0	46.0	0.0	46.0	0.0	200.0	0.0	0.0	0.0	46.0
March	-1.5	0.0	0.0	0.9871	0.00	51.2	51.2	0.0	51.2	0.0	200.0	0.0	0.0	0.0	51.2
April	6.0	1.3	27.6	1.1200	30.88	64.9	34.0	0.0	34.0	0.0	200.0	0.0	30.9	0.0	34.0
May	12.5	4.0	60.4	1.2290	74.29	87.1	12.8	0.0	12.8	0.0	200.0	0.0	74.3	0.0	12.8
June	17.7	6.8	87.7	1.2900	113.11	84.8	0.0	28.3	-28.3	-28.3	173.0	-27.0	111.8	1.3	0.0
July	20.5	8.5	102.6	1.2581	129.07	86.4	0.0	42.7	-42.7	-71.0	140.0	-33.0	119.4	9.7	0.0
August	19.6	7.9	97.8	1.1613	113.55	88.4	0.0	25.2	-25.2	-96.1	123.0	-17.0	105.4	8.2	0.0
September	15.3	5.4	75.0	1.0400	78.03	84.2	6.2	0.0	6.2	0.0	129.2	6.2	78.0	0.0	0.0
October	8.6	2.3	40.5	0.9194	37.25	72.9	35.6	0.0	35.6	0.0	164.8	35.6	37.3	0.0	0.0
November	2.3	0.3	9.7	0.8000	7.73	84.6	76.9	0.0	76.9	0.0	200.0	35.2	7.7	0.0	41.7
December	-3.7	0.0	0.0	0.7355	0.00	55.5	55.5	0.0	55.5	0.0	200.0	0.0	0.0	0.0	55.5
TOTALS		**36.5**			**583.9**	**857.7**	**369.9**	**96.1**	**273.8**	**-96.1**	**2130.0**	**0.0**	**564.8**	**19.1**	**292.9**

TOTAL WATER SURPLUS **273.8** **mm**

TOTAL MOISTURE SURPLUS **292.9** **mm**

NOTES:

1) Water budget adjusted for latitude and daylight.

2) (°C) - Represents calculated mean of daily temperatures for the month.

3) Precipitation and Temperature data from the King Smoke Tree Station located at latitude 44°01'00.000" N, longitude 79°31'00.000" W, elevation 352.00.

4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.

5) Total Moisture Surplus (Thornthwaite and Mather, 1957) is calculated as total precipitation minus actual evapotranspiration.

TABLE H-4
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (KING SMOKE TREE CLIMATE STATION)
Silt Loam, Uncultivated (250 mm HOLDING CAPACITY)
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

	Thornthwaite (1948)									Thornthwaite and Mather (1957)					
Month	Mean Temperature (°C)	Heat Index	Potential Evapo-transpiration (mm)	Daylight Correction Value	Adjusted Potential Evapo-transpiration (mm)	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)	TP - PET (mm)	Accumulated Potential Water Loss (mm)	Soil Moisture (mm)	Change in Soil Moisture (mm) (delta S)	Actual Evapo-transpiration (mm)	Moisture Deficit (mm)	Unadjusted Moisture Surplus (mm)
January	-7.4	0.0	0.0	0.7839	0.00	51.7	51.7	0.0	51.7	0.0	250.0	0.0	0.0	0.0	51.7
February	-6.1	0.0	0.0	0.8679	0.00	46.0	46.0	0.0	46.0	0.0	250.0	0.0	0.0	0.0	46.0
March	-1.5	0.0	0.0	0.9871	0.00	51.2	51.2	0.0	51.2	0.0	250.0	0.0	0.0	0.0	51.2
April	6.0	1.3	27.6	1.1200	30.88	64.9	34.0	0.0	34.0	0.0	250.0	0.0	30.9	0.0	34.0
May	12.5	4.0	60.4	1.2290	74.29	87.1	12.8	0.0	12.8	0.0	250.0	0.0	74.3	0.0	12.8
June	17.7	6.8	87.7	1.2900	113.11	84.8	0.0	28.3	-28.3	-28.3	223.0	-27.0	111.8	1.3	0.0
July	20.5	8.5	102.6	1.2581	129.07	86.4	0.0	42.7	-42.7	-71.0	188.0	-35.0	121.4	7.7	0.0
August	19.6	7.9	97.8	1.1613	113.55	88.4	0.0	25.2	-25.2	-96.1	170.0	-18.0	106.4	7.2	0.0
September	15.3	5.4	75.0	1.0400	78.03	84.2	6.2	0.0	6.2	0.0	176.2	6.2	78.0	0.0	0.0
October	8.6	2.3	40.5	0.9194	37.25	72.9	35.6	0.0	35.6	0.0	211.8	35.6	37.3	0.0	0.0
November	2.3	0.3	9.7	0.8000	7.73	84.6	76.9	0.0	76.9	0.0	250.0	38.2	7.7	0.0	38.7
December	-3.7	0.0	0.0	0.7355	0.00	55.5	55.5	0.0	55.5	0.0	250.0	0.0	0.0	0.0	55.5
TOTALS		**36.5**			**583.9**	**857.7**	**369.9**	**96.1**	**273.8**	**-96.1**	**2719.0**	**0.0**	**567.8**	**16.1**	**289.9**

TOTAL WATER SURPLUS **273.8** **mm**

TOTAL MOISTURE SURPLUS **289.9** **mm**

NOTES:

1) Water budget adjusted for latitude and daylight.

3) Precipitation and Temperature data from the Welland Climate Station located at latitude 42°59'33.096" N, longitude 79°15'40.098" W, elevation 175.30 m.

3) Precipitation and Temperature data from the King Smoke Tree Station located at latitude 44°01'00.000" N, longitude 79°31'00.000" W, elevation 352.00.

4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.

5) Total Moisture Surplus (Thornthwaite and Mather, 1957) is calculated as total precipitation minus actual evapotranspiration.

TABLE H-5
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (KING SMOKE TREE CLIMATE STATION)
Silt Loam, Woodland (400 mm HOLDING CAPACITY)
HYDROGEOLOGICAL ASSESSMENT AND WATER BALANCE STUDY
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

	Thornthwaite (1948)									Thornthwaite and Mather (1957)					
Month	Mean Temperature (°C)	Heat Index	Potential Evapo-transpiration (mm)	Daylight Correction Value	Adjusted Potential Evapo-transpiration (mm)	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)	TP - PET (mm)	Accumulated Potential Water Loss (mm)	Soil Moisture (mm)	Change in Soil Moisture (mm) (delta S)	Actual Evapo-transpiration (mm)	Moisture Deficit (mm)	Unadjusted Moisture Surplus (mm)
January	-7.4	0.0	0.0	0.7839	0.00	51.7	51.7	0.0	51.7	0.0	400.0	0.0	0.0	0.0	51.7
February	-6.1	0.0	0.0	0.8679	0.00	46.0	46.0	0.0	46.0	0.0	400.0	0.0	0.0	0.0	46.0
March	-1.5	0.0	0.0	0.9871	0.00	51.2	51.2	0.0	51.2	0.0	400.0	0.0	0.0	0.0	51.2
April	6.0	1.3	27.6	1.1200	30.88	64.9	34.0	0.0	34.0	0.0	400.0	0.0	30.9	0.0	34.0
May	12.5	4.0	60.4	1.2290	74.29	87.1	12.8	0.0	12.8	0.0	400.0	0.0	74.3	0.0	12.8
June	17.7	6.8	87.7	1.2900	113.11	84.8	0.0	28.3	-28.3	-28.3	373.0	-27.0	111.8	1.3	0.0
July	20.5	8.5	102.6	1.2581	129.07	86.4	0.0	42.7	-42.7	-71.0	335.0	-38.0	124.4	4.7	0.0
August	19.6	7.9	97.8	1.1613	113.55	88.4	0.0	25.2	-25.2	-96.1	314.0	-21.0	109.4	4.2	0.0
September	15.3	5.4	75.0	1.0400	78.03	84.2	6.2	0.0	6.2	0.0	320.2	6.2	78.0	0.0	0.0
October	8.6	2.3	40.5	0.9194	37.25	72.9	35.6	0.0	35.6	0.0	355.8	35.6	37.3	0.0	0.0
November	2.3	0.3	9.7	0.8000	7.73	84.6	76.9	0.0	76.9	0.0	400.0	44.2	7.7	0.0	32.7
December	-3.7	0.0	0.0	0.7355	0.00	55.5	55.5	0.0	55.5	0.0	400.0	0.0	0.0	0.0	55.5
TOTALS		**36.5**			**583.9**	**857.7**	**369.9**	**96.1**	**273.8**	**-96.1**	**4498.0**	**0.0**	**573.8**	**10.1**	**283.9**

TOTAL WATER SURPLUS **273.8** **mm**

TOTAL MOISTURE SURPLUS **283.9** **mm**

NOTES:

1) Water budget adjusted for latitude and daylight.

3) Precipitation and Temperature data from the Welland Climate Station located at latitude 42°59'33.096" N, longitude 79°15'40.098" W, elevation 175.30 m.

3) Precipitation and Temperature data from the King Smoke Tree Station located at latitude 44°01'00.000" N, longitude 79°31'00.000" W, elevation 352.00.

4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.

5) Total Moisture Surplus (Thornthwaite and Mather, 1957) is calculated as total precipitation minus actual evapotranspiration.

APPENDIX

I WATER BUDGET CALCULATIONS – PRE-DEVELOPMENT

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-2	Off-Site to SE Corner - Via Creek	3513.1	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	3013.2	283.9	2015.8	0	0	283.9	997.4	241.3	847.8	42.6	149.6	997.4
Cat A-16	Off-Site to SE Corner - Via Creek	9.7	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	8.3	771.9	0.8	0	0	771.9	7.5	0.0	0.0	771.9	7.5	7.5
Cat A-17	Off-Site to SE Corner - Via Creek	12.8	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	10.9	771.9	1.1	0	0	771.9	9.8	0.0	0.0	771.9	9.8	9.8
Cat A-18	Off-Site to SE Corner - Via Creek	32.6	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	27.9	771.9	2.8	0	0	771.9	25.1	0.0	0.0	771.9	25.1	25.1
Cat A-19	Off-Site to SE Corner - Via Creek	4.4	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	3.8	771.9	0.4	0	0	771.9	3.4	0.0	0.0	771.9	3.4	3.4
Cat A-20	Off-Site to SE Corner - Via Creek	1.4	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	1.2	771.9	0.1	0	0	771.9	1.1	0.0	0.0	771.9	1.1	1.1
Cat A-21	Off-Site to SE Corner - Via Creek	27.0	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	23.1	771.9	2.3	0	0	771.9	20.8	0.0	0.0	771.9	20.8	20.8
Cat A-22	Off-Site to SE Corner - Via Creek	26.8	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	23.0	771.9	2.3	0	0	771.9	20.7	0.0	0.0	771.9	20.7	20.7
Cat A-23	Off-Site to SE Corner - Via Creek	109.1	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	93.6	771.9	9.4	0	0	771.9	84.2	0.0	0.0	771.9	84.2	84.2
Cat A-24	Off-Site to SE Corner - Via Creek	124.0	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	106.4	771.9	10.6	0	0	771.9	95.7	0.0	0.0	771.9	95.7	95.7
Cat A-25	Off-Site to SE Corner - Via Creek	430.0	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	368.8	771.9	36.9	0	0	771.9	332.0	0.0	0.0	771.9	332.0	332.0
Cat A-26	Off-Site to SE Corner - Via Creek	228.6	Building	0	Silt Loam	0.4	0.15	0.55	0	857.7	196.1	771.9	19.6	0	0	771.9	176.5	0.0	0.0	771.9	176.5	176.5
Cat A-27	Off-Site to SE Corner - Via Creek	340.3	Building	0	Silt Loam	0.4	0.15	0.55	0	857.7	291.9	771.9	29.2	0	0	771.9	262.7	0.0	0.0	771.9	262.7	262.7
Cat A-28	Off-Site to SE Corner - Via Creek	189.8	Gravel	0.05	Silt Loam	0.4	0.15	0.6	0.6	857.7	162.8	301.9	105.5	0	0	301.9	57.3	181.1	34.4	120.8	22.9	57.3
Cat A-29	Off-Site to SE Corner - Via Creek	172.5	Patio	0	Silt Loam	0.4	0.15	0.55	0	857.7	148.0	771.9	14.8	0	0	771.9	133.2	0.0	0.0	771.9	133.2	133.2
Cat A-30	Off-Site to SE Corner - Via Creek	2427.6	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	2082.1	283.9	1392.9	0	0	283.9	689.2	212.9	516.9	71.0	172.3	689.2
Cat A-31	Off-Site to SE Corner - Via Creek	309.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	265.5	301.9	172.1	0	0	301.9	93.5	211.3	65.4	90.6	28.0	93.5
Cat A-32	Off-Site to SE Corner - Via Creek	37.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	32.3	301.9	20.9	0	0	301.9	11.4	211.3	8.0	90.6	3.4	11.4
Cat A-33	Off-Site to SE Corner - Via Creek	288.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	247.2	301.9	160.2	0	0	301.9	87.0	211.3	60.9	90.6	26.1	87.0
Cat A-34	Off-Site to SE Corner - Via Creek	13.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	11.6	301.9	7.5	0	0	301.9	4.1	211.3	2.9	90.6	1.2	4.1
Cat A-35	Off-Site to SE Corner - Via Creek	77.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	66.3	301.9	43.0	0	0	301.9	23.3	211.3	16.3	90.6	7.0	23.3
Cat A-36	Off-Site to SE Corner - Via Creek	97.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	83.2	301.9	53.9	0	0	301.9	29.3	211.3	20.5	90.6	8.8	29.3
Cat A-37	Off-Site to SE Corner - Via Creek	12.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	10.8	301.9	7.0	0	0	301.9	3.8	211.3	2.7	90.6	1.1	3.8
Cat A-38	Off-Site to SE Corner - Via Creek	136.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	116.8	301.9	75.7	0	0	301.9	41.1	211.3	28.8	90.6	12.3	41.1
Cat A-39	Off-Site to SE Corner - Via Creek	140.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	120.3	301.9	78.0	0	0	301.9	42.4	211.3	29.7	90.6	12.7	42.4
Cat A-40	Off-Site to SE Corner - Via Creek	150.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	128.7	301.9	83.4	0	0	301.9	45.3	211.3	31.7	90.6	13.6	45.3
Cat A-41	Off-Site to SE Corner - Via Creek	273.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	234.8	301.9	152.1	0	0	301.9	82.6	211.3	57.8	90.6	24.8	82.6
Cat A-42	Off-Site to SE Corner - Via Creek	116.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	99.8	301.9	64.7	0	0	301.9	35.1	211.3	24.6	90.6	10.5	35.1
Cat A-43	Off-Site to SE Corner - Via Creek	2.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	1.9	301.9	1.3	0	0	301.9	0.7	211.3	0.5	90.6	0.2	0.7
Cat A-44	Off-Site to SE Corner - Via Creek	193.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	165.5	301.9	107.3	0	0	301.9	58.3	211.3	40.8	90.6	17.5	58.3
Cat A-45	Off-Site to SE Corner - Via Creek	89.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	76.7	301.9	49.7	0	0	301.9	27.0	211.3	18.9	90.6	8.1	27.0
Cat A-46	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.0	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-47	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.0	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-48	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.0	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-49	Off-Site to SE Corner - Via Creek	1.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	1.4	301.9	0.9	0	0	301.9	0.5	211.3	0.4	90.6	0.2	0.5
Cat A-50	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-51	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-52	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-53	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-54	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-55	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-56	Off-Site to SE Corner - Via Creek	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat A-57	Off-Site to SE Corner - Via Creek	9.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	7.8	301.9	5.1	0	0	301.9	2.8	211.3	1.9	90.6	0.8	2.8
Cat A-58	Off-Site to SE Corner - Via Creek	55.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	47.9	301.9	31.0	0	0	301.9	16.9	211.3	11.8	90.6	5.1	16.9
Cat A-59	Off-Site to SE Corner - Via Creek	60.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	51.5	301.9	33.4	0	0	301.9	18.1	211.3	12.7	90.6	5.4	18.1
Cat A-60	Off-Site to SE Corner - Via Creek	43.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	37.5	301.9	24.3	0	0	301.9	13.2	211.3	9.2	90.6	4.0	13.2
Cat A-61	Off-Site to SE Corner - Via Creek	44.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	38.4	301.9	24.9	0	0	301.9	13.5	211.3	9.5	90.6	4.1	13.5
Cat A-62	Off-Site to SE Corner - Via Creek	46.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	40.0	301.9	25.9	0	0	301.9	14.1	211.3	9.9	90.6	4.2	14.1
Cat A-63	Off-Site to SE Corner - Via Creek	46.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	40.2	301.9	26.0	0	0	301.9	14.1	211.3	9.9	90.6	4.2	14.1
Cat A-64	Off-Site to SE Corner - Via Creek	48.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	41.2	301.9	26.7	0	0	301.9	14.5	211.3	10.2	90.6	4.4	14.5
Cat A-65	Off-Site to SE Corner - Via Creek	36.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	31.5	301.9	20.4	0	0	301.9	11.1	211.3	7.8	90.6	3.3	11.1
Cat A-66	Off-Site to SE Corner - Via Creek	43.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	37.2	301.9	24.1	0	0	301.9	13.1	211.3	9.2	90.6	3.9	13.1
Cat A-67	Off-Site to SE Corner - Via Creek	5.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.6	301.9	3.0	0	0	301.9	1.6	211.3	1.1	90.6	0.5	1.6
Cat A-68	Off-Site to SE Corner - Via Creek	914.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	784.7	301.9	508.5	0	0	301.9	276.2	211.3	193.4	90.6	82.9	276.2
Cat A-69	Off-Site to SE Corner - Via Creek	2.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	1.7	301.9	1.1	0	0	301.9	0.6	211.3	0.4	90.6	0.2	0.6
Cat A-70	Off-Site to SE Corner - Via Creek	132.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	113.8	301.9	73.7	0	0	301.9	40.0	211.3	28.0	90.6	12.0	40.0
Cat A-71	Off-Site to SE Corner - Via Creek	177.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	152.6	301.9	98.9	0	0	301.9	53.7	211.3	37.6	90.6	16.1	53.7
Cat A-72	Off-Site to SE Corner - Via Creek	23.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	20.2	301.9	13.1	0	0	301.9	7.1	211.3	5.0	90.6	2.1	7.1
Cat A-73	Off-Site to SE Corner - Via Creek	162.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	139.2	301.9	90.2	0	0	301.9	49.0	211.3	34.3	90.6	14.7	49.0
Cat A-74	Off-Site to SE Corner - Via Creek	158.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	135.6	301.9	87.9	0	0	301.9	47.7	211.3	33.4	90.6	14.3	47.7
Cat A-75	Off-Site to SE Corner - Via Creek	148.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	127.3	301.9	82.5	0	0	301.9	44.8	211.3	31.4	90.6	13.4	44.8
Cat A-76	Off-Site to SE Corner - Via Creek	24.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	21.2	301.9	13.7	0	0	301.9	7.5	211.3	5.2	90.6	2.2	7.5
Cat A-77	Off-Site to SE Corner - Via Creek	182.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	156.1	301.9	101.2	0	0	301.9	55.0	211.3	38.5	90.6	16.5	55.0
Cat A-78	Off-Site to SE Corner - Via Creek	3.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	2.8	301.9	1.8	0	0	301.9	1.0	211.3	0.7	90.6	0.3	1.0
Cat A-79	Off-Site to SE Corner - Via Creek	176.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	151.5	301.9	98.2	0	0	301.9	53.3	211.3	37.3	90.6	16.0	53.3
Cat A-80	Off-Site to SE Corner - Via Creek	138.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	118.6	301.9	76.9	0	0	301.9	41.8	211.3	29.2	90.6	12.5	41.8
Cat A-81	Off-Site to SE Corner - Via Creek	104.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	89.6	301.9	58.1	0	0	301.9	31.5	211.3	22.1	90.6	9.5	31.5
Cat A-82	Off-Site to SE Corner - Via Creek	44.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	38.4	301.9	24.9	0	0	301.9	13.5	211.3	9.5	90.6	4.1	13.5
Cat A-83	Off-Site to SE Corner - Via Creek	105.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	90.4	301.9	58.6	0	0	301.9	31.8	211.3	22.3	90.6	9.5	31.8
Cat A-84	Off-Site to SE Corner - Via Creek	9.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	7.9	301.9	5.1	0	0	301.9	2.8	211.3	1.9	90.6	0.8	2.8
Cat A-85	Off-Site to SE Corner - Via Creek	95.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	81.8	301.9	53.0	0	0	301.9	28.8	211.3	20.2	90.6	8.6	28.8
Cat A-86	Off-Site to SE Corner - Via Creek	4.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	3.8	301.9	2.5	0	0	301.9	1.3	211.3	0.9	90.6	0.4	1.3
Cat A-87	Off-Site to SE Corner - Via Creek	28.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	24.8	301.9	16.1	0	0	301.9	8.7	211.3	6.1	90.6	2.6	8.7
Cat A-88	Off-Site to SE Corner - Via Creek	63.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	54.5	301.9	35.3	0	0	301.9	19.2	211.3	13.4	90.6	5.8	19.2
Cat A-108	Off-Site to SE Corner - Via Creek	1506.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	1292.1	289.9	855.3	0	0	289.9	436.7	231.9	349.4	58.0	87.3	436.7
Cat A-109	Off-Site to SE Corner - Via Creek	471.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	404.7	289.9	267.9	0	0	289.9	136.8	231.9	109.4	58.0	27.4	136.8
Cat A-110	Off-Site to SE Corner - Via Creek	67.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	57.8	289.9	38.3	0	0	289.9	19.5	231.9	15.6	58.0	3.9	19.5
Cat A-111	Off-Site to SE Corner - Via Creek	386.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	331.4	289.9	219.4	0	0	289.9	112.0	231.9	89.6	58.0	22.4	112.0
Cat A-112	Off-Site to SE Corner - Via Creek	12.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	11.0	289.9	7.3	0	0	289.9	3.7	231.9	3.0	58.0	0.7	3.7
Cat A-113	Off-Site to SE Corner - Via Creek	93.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	80.6	289.9	53.3	0	0	289.9	27.2	231.9	21.8	58.0	5.4	27.2
Cat A-114	Off-Site to SE Corner - Via Creek	77.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	66.8	289.9	44.2	0	0	289.9	22.6	231.9	18.1	58.0	4.5	22.6

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-115	Off-Site to SE Corner - Via Creek	71.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	61.7	289.9	40.8	0	0	289.9	20.9	231.9	16.7	58.0	4.2	20.9
Cat A-116	Off-Site to SE Corner - Via Creek	90.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	77.3	289.9	51.2	0	0	289.9	26.1	231.9	20.9	58.0	5.2	26.1
Cat A-117	Off-Site to SE Corner - Via Creek	108.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	92.8	289.9	61.5	0	0	289.9	31.4	231.9	25.1	58.0	6.3	31.4
Cat A-118	Off-Site to SE Corner - Via Creek	127.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	109.0	289.9	72.1	0	0	289.9	36.8	231.9	29.5	58.0	7.4	36.8
Cat A-119	Off-Site to SE Corner - Via Creek	149.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	128.4	289.9	85.0	0	0	289.9	43.4	231.9	34.7	58.0	8.7	43.4
Cat A-120	Off-Site to SE Corner - Via Creek	143.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	122.9	289.9	81.4	0	0	289.9	41.5	231.9	33.2	58.0	8.3	41.5
Cat A-121	Off-Site to SE Corner - Via Creek	103.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	88.8	289.9	58.8	0	0	289.9	30.0	231.9	24.0	58.0	6.0	30.0
Cat A-122	Off-Site to SE Corner - Via Creek	99.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	85.2	289.9	56.4	0	0	289.9	28.8	231.9	23.1	58.0	5.8	28.8
Cat A-123	Off-Site to SE Corner - Via Creek	298.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	256.0	289.9	169.4	0	0	289.9	86.5	231.9	69.2	58.0	17.3	86.5
Cat A-124	Off-Site to SE Corner - Via Creek	298.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	256.0	289.9	169.4	0	0	289.9	86.5	231.9	69.2	58.0	17.3	86.5
Cat A-125	Off-Site to SE Corner - Via Creek	298.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	256.0	289.9	169.4	0	0	289.9	86.5	231.9	69.2	58.0	17.3	86.5
Cat A-126	Off-Site to SE Corner - Via Creek	298.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	256.0	289.9	169.4	0	0	289.9	86.5	231.9	69.2	58.0	17.3	86.5
Cat A-127	Off-Site to SE Corner - Via Creek	237.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	203.5	289.9	134.7	0	0	289.9	68.8	231.9	55.0	58.0	13.8	68.8
Cat A-128	Off-Site to SE Corner - Via Creek	68.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	59.1	289.9	39.1	0	0	289.9	20.0	231.9	16.0	58.0	4.0	20.0
Cat A-129	Off-Site to SE Corner - Via Creek	76.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	65.7	289.9	43.5	0	0	289.9	22.2	231.9	17.8	58.0	4.4	22.2
Cat A-130	Off-Site to SE Corner - Via Creek	82.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	71.1	289.9	47.0	0	0	289.9	24.0	231.9	19.2	58.0	4.8	24.0
Cat A-131	Off-Site to SE Corner - Via Creek	75.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	64.6	289.9	42.8	0	0	289.9	21.8	231.9	17.5	58.0	4.4	21.8
Cat A-132	Off-Site to SE Corner - Via Creek	73.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	63.3	289.9	41.9	0	0	289.9	21.4	231.9	17.1	58.0	4.3	21.4
Cat A-133	Off-Site to SE Corner - Via Creek	74.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	64.0	289.9	42.4	0	0	289.9	21.6	231.9	17.3	58.0	4.3	21.6
Cat A-134	Off-Site to SE Corner - Via Creek	9.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	7.9	289.9	5.2	0	0	289.9	2.7	231.9	2.1	58.0	0.5	2.7
Cat A-135	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-136	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-137	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-138	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-139	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-140	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-141	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-142	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-143	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-144	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-145	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-146	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-147	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-148	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-149	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-150	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-151	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-152	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-153	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-154	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-155	Off-Site to SE Corner - Via Creek	37.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	32.5	289.9	21.5	0	0	289.9	11.0	231.9	8.8	58.0	2.2	11.0
Cat A-156	Off-Site to SE Corner - Via Creek	45.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	39.1	289.9	25.9	0	0	289.9	13.2	231.9	10.6	58.0	2.6	13.2
Cat A-157	Off-Site to SE Corner - Via Creek	38.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	33.0	289.9	21.8	0	0	289.9	11.2	231.9	8.9	58.0	2.2	11.2
Cat A-158	Off-Site to SE Corner - Via Creek	46.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	40.1	289.9	26.6	0	0	289.9	13.6	231.9	10.8	58.0	2.7	13.6
Cat A-159	Off-Site to SE Corner - Via Creek	47.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	40.7	289.9	27.0	0	0	289.9	13.8	231.9	11.0	58.0	2.8	13.8
Cat A-160	Off-Site to SE Corner - Via Creek	47.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	40.8	289.9	27.0	0	0	289.9	13.8	231.9	11.0	58.0	2.8	13.8
Cat A-161	Off-Site to SE Corner - Via Creek	47.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	41.1	289.9	27.2	0	0	289.9	13.9	231.9	11.1	58.0	2.8	13.9
Cat A-162	Off-Site to SE Corner - Via Creek	48.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	41.2	289.9	27.3	0	0	289.9	13.9	231.9	11.1	58.0	2.8	13.9
Cat A-163	Off-Site to SE Corner - Via Creek	49.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	42.5	289.9	28.2	0	0	289.9	14.4	231.9	11.5	58.0	2.9	14.4
Cat A-164	Off-Site to SE Corner - Via Creek	50.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	43.6	289.9	28.9	0	0	289.9	14.7	231.9	11.8	58.0	2.9	14.7
Cat A-165	Off-Site to SE Corner - Via Creek	55.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	47.2	289.9	31.3	0	0	289.9	16.0	231.9	12.8	58.0	3.2	16.0
Cat A-166	Off-Site to SE Corner - Via Creek	42.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	36.4	289.9	24.1	0	0	289.9	12.3	231.9	9.8	58.0	2.5	12.3
Cat A-167	Off-Site to SE Corner - Via Creek	51.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	44.1	289.9	29.2	0	0	289.9	14.9	231.9	11.9	58.0	3.0	14.9
Cat A-168	Off-Site to SE Corner - Via Creek	39.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	33.6	289.9	22.2	0	0	289.9	11.4	231.9	9.1	58.0	2.3	11.4
Cat A-169	Off-Site to SE Corner - Via Creek	57.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	49.6	289.9	32.8	0	0	289.9	16.8	231.9	13.4	58.0	3.4	16.8
Cat A-170	Off-Site to SE Corner - Via Creek	42.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	36.8	289.9	24.4	0	0	289.9	12.4	231.9	10.0	58.0	2.5	12.4
Cat A-171	Off-Site to SE Corner - Via Creek	42.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	36.1	289.9	23.9	0	0	289.9	12.2	231.9	9.8	58.0	2.4	12.2
Cat A-172	Off-Site to SE Corner - Via Creek	57.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	49.5	289.9	32.8	0	0	289.9	16.7	231.9	13.4	58.0	3.3	16.7
Cat A-173	Off-Site to SE Corner - Via Creek	41.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	35.6	289.9	23.6	0	0	289.9	12.0	231.9	9.6	58.0	2.4	12.0
Cat A-174	Off-Site to SE Corner - Via Creek	58.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	50.1	289.9	33.2	0	0	289.9	16.9	231.9	13.6	58.0	3.4	16.9
Cat A-175	Off-Site to SE Corner - Via Creek	1365.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	1171.4	289.9	775.5	0	0	289.9	396.0	231.9	316.8	58.0	79.2	396.0
Cat A-176	Off-Site to SE Corner - Via Creek	168.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	144.4	289.9	95.6	0	0	289.9	48.8	231.9	39.1	58.0	9.8	48.8
Cat A-177	Off-Site to SE Corner - Via Creek	220.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	189.1	289.9	125.2	0	0	289.9	63.9	231.9	51.1	58.0	12.8	63.9
Cat A-178	Off-Site to SE Corner - Via Creek	226.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	194.3	289.9	128.6	0	0	289.9	65.7	231.9	52.5	58.0	13.1	65.7
Cat A-179	Off-Site to SE Corner - Via Creek	208.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	178.6	289.9	118.2	0	0	289.9	60.4	231.9	48.3	58.0	12.1	60.4
Cat A-180	Off-Site to SE Corner - Via Creek	190.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	163.1	289.9	108.0	0	0	289.9	55.1	231.9	44.1	58.0	11.0	55.1
Cat A-181	Off-Site to SE Corner - Via Creek	171.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	147.0	289.9	97.3	0	0	289.9	49.7	231.9	39.8	58.0	9.9	49.7
Cat A-182	Off-Site to SE Corner - Via Creek	148.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	127.6	289.9	84.4	0	0	289.9	43.1	231.9	34.5	58.0	8.6	43.1
Cat A-183	Off-Site to SE Corner - Via Creek	155.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	133.0	289.9	88.1	0	0	289.9	45.0	231.9	36.0	58.0	9.0	45.0
Cat A-184	Off-Site to SE Corner - Via Creek	194.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	167.2	289.9	110.7	0	0	289.9	56.5	231.9	45.2	58.0	11.3	56.5
Cat A-185	Off-Site to SE Corner - Via Creek	199.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	170.7	289.9	113.0	0	0	289.9	57.7	231.9	46.2	58.0	11.5	57.7
Cat A-186	Off-Site to SE Corner - Via Creek	206.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	177.5	289.9	117.5	0	0	289.9	60.0	231.9	48.0	58.0	12.0	60.0
Cat A-187	Off-Site to SE Corner - Via Creek	177.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	152.4	289.9	100.9	0	0	289.9	51.5	231.9	41.2	58.0	10.3	51.5
Cat A-188	Off-Site to SE Corner - Via Creek	1.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	1.1	289.9	0.7	0	0	289.9	0.4	231.9	0.3	58.0	0.1	0.4
Cat A-189	Off-Site to SE Corner - Via Creek	224.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	192.1	289.9	127.2	0	0	289.9	64.9	231.9	52.0	58.0	13.0	64.9
Cat A-190	Off-Site to SE Corner - Via Creek	221.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	190.3	289.9	125.9	0	0	289.9	64.3	231.9	51.4	58.0	12.9	64.3
Cat A-191	Off-Site to SE Corner - Via Creek	32.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	27.8	289.9	18.4	0	0	289.9	9.4	231.9	7.5	58.0	1.9	9.4
Cat A-192	Off-Site to SE Corner - Via Creek	75.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	65.0	289.9	43.0	0	0	289.9	22.0	231.9	17.6	58.0	4.4	22.0
Cat A-193	Off-Site to SE Corner - Via Creek	167.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	143.5	289.9	95.0	0	0	289.9	48.5	231.9	38.8	58.0	9.7	48.5
Cat A-194	Off-Site to SE Corner - Via Creek	223.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	191.4	289.9	126.7	0	0	289.9	64.7	231.9	51.7	58.0	12.9	64.7
Cat A-195	Off-Site to SE Corner - Via Creek	224.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	192.7	289.9	127.5	0	0	289.9	65.1	231.9	52.1	58.0	13.0	65.1

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-196	Off-Site to SE Corner - Via Creek	223.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	192.0	289.9	127.1	0	0	289.9	64.9	231.9	51.9	58.0	13.0	64.9
Cat A-197	Off-Site to SE Corner - Via Creek	32.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	27.6	289.9	18.2	0	0	289.9	9.3	231.9	7.5	58.0	1.9	9.3
Cat A-198	Off-Site to SE Corner - Via Creek	14.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	12.5	289.9	8.3	0	0	289.9	4.2	231.9	3.4	58.0	0.8	4.2
Cat A-199	Off-Site to SE Corner - Via Creek	49.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	42.2	289.9	28.0	0	0	289.9	14.3	231.9	11.4	58.0	2.9	14.3
Cat A-200	Off-Site to SE Corner - Via Creek	111.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	95.6	289.9	63.3	0	0	289.9	32.3	231.9	25.9	58.0	6.5	32.3
Cat A-201	Off-Site to SE Corner - Via Creek	147.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	126.4	289.9	83.7	0	0	289.9	42.7	231.9	34.2	58.0	8.5	42.7
Cat A-202	Off-Site to SE Corner - Via Creek	72.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	62.0	289.9	41.0	0	0	289.9	20.9	231.9	16.8	58.0	4.2	20.9
Cat A-203	Off-Site to SE Corner - Via Creek	9.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	8.3	289.9	5.5	0	0	289.9	2.8	231.9	2.2	58.0	0.6	2.8
Cat A-204	Off-Site to SE Corner - Via Creek	117.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	101.0	289.9	66.8	0	0	289.9	34.1	231.9	27.3	58.0	6.8	34.1
Cat A-205	Off-Site to SE Corner - Via Creek	50.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	43.1	289.9	28.6	0	0	289.9	14.6	231.9	11.7	58.0	2.9	14.6
Cat A-206	Off-Site to SE Corner - Via Creek	274.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	235.8	289.9	156.1	0	0	289.9	79.7	231.9	63.8	58.0	15.9	79.7
Cat A-207	Off-Site to SE Corner - Via Creek	274.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	235.8	289.9	156.1	0	0	289.9	79.7	231.9	63.8	58.0	15.9	79.7
Cat A-208	Off-Site to SE Corner - Via Creek	219.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	188.4	289.9	124.7	0	0	289.9	63.7	231.9	50.9	58.0	12.7	63.7
Cat A-209	Off-Site to SE Corner - Via Creek	63.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	54.5	289.9	36.1	0	0	289.9	18.4	231.9	14.7	58.0	3.7	18.4
Cat A-210	Off-Site to SE Corner - Via Creek	49.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	42.3	289.9	28.0	0	0	289.9	14.3	231.9	11.4	58.0	2.9	14.3
Cat A-211	Off-Site to SE Corner - Via Creek	163.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	140.2	289.9	92.8	0	0	289.9	47.4	231.9	37.9	58.0	9.5	47.4
Cat A-212	Off-Site to SE Corner - Via Creek	127.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	109.4	289.9	72.4	0	0	289.9	37.0	231.9	29.6	58.0	7.4	37.0
Cat A-213	Off-Site to SE Corner - Via Creek	46.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	39.5	289.9	26.1	0	0	289.9	13.3	231.9	10.7	58.0	2.7	13.3
Cat A-214	Off-Site to SE Corner - Via Creek	208.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	178.8	289.9	118.3	0	0	289.9	60.4	231.9	48.3	58.0	12.1	60.4
Cat A-215	Off-Site to SE Corner - Via Creek	50.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	43.6	289.9	28.8	0	0	289.9	14.7	231.9	11.8	58.0	2.9	14.7
Cat A-216	Off-Site to SE Corner - Via Creek	6.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	5.9	289.9	3.9	0	0	289.9	2.0	231.9	1.6	58.0	0.4	2.0
Cat A-217	Off-Site to SE Corner - Via Creek	253.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	217.4	289.9	143.9	0	0	289.9	73.5	231.9	58.8	58.0	14.7	73.5
Cat A-218	Off-Site to SE Corner - Via Creek	20.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	17.7	289.9	11.7	0	0	289.9	6.0	231.9	4.8	58.0	1.2	6.0
Cat A-219	Off-Site to SE Corner - Via Creek	48.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	41.8	289.9	27.7	0	0	289.9	14.1	231.9	11.3	58.0	2.8	14.1
Cat A-220	Off-Site to SE Corner - Via Creek	9.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	8.5	289.9	5.6	0	0	289.9	2.9	231.9	2.3	58.0	0.6	2.9
Cat A-221	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-222	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-223	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-224	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-225	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-226	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-227	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-228	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-229	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-230	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-231	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat A-232	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-233	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat A-234	Off-Site to SE Corner - Via Creek	53.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	45.9	289.9	30.4	0	0	289.9	15.5	231.9	12.4	58.0	3.1	15.5
Cat A-235	Off-Site to SE Corner - Via Creek	75.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	64.9	289.9	43.0	0	0	289.9	21.9	231.9	17.6	58.0	4.4	21.9
Cat A-236	Off-Site to SE Corner - Via Creek	44.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	38.1	289.9	25.2	0	0	289.9	12.9	231.9	10.3	58.0	2.6	12.9
Cat A-237	Off-Site to SE Corner - Via Creek	38.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	33.2	289.9	22.0	0	0	289.9	11.2	231.9	9.0	58.0	2.2	11.2
Cat A-238	Off-Site to SE Corner - Via Creek	45.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	39.2	289.9	25.9	0	0	289.9	13.2	231.9	10.6	58.0	2.6	13.2
Cat A-239	Off-Site to SE Corner - Via Creek	35.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	30.7	289.9	20.3	0	0	289.9	10.4	231.9	8.3	58.0	2.1	10.4
Cat A-240	Off-Site to SE Corner - Via Creek	43.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	37.7	289.9	24.9	0	0	289.9	12.7	231.9	10.2	58.0	2.5	12.7
Cat A-241	Off-Site to SE Corner - Via Creek	33.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	29.1	289.9	19.3	0	0	289.9	9.8	231.9	7.9	58.0	2.0	9.8
Cat A-242	Off-Site to SE Corner - Via Creek	27.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	23.9	289.9	15.8	0	0	289.9	8.1	231.9	6.5	58.0	1.6	8.1
Cat A-243	Off-Site to SE Corner - Via Creek	53.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	45.9	289.9	30.4	0	0	289.9	15.5	231.9	12.4	58.0	3.1	15.5
Cat A-244	Off-Site to SE Corner - Via Creek	48.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	41.7	289.9	27.6	0	0	289.9	14.1	231.9	11.3	58.0	2.8	14.1
Cat A-245	Off-Site to SE Corner - Via Creek	47.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	40.7	289.9	27.0	0	0	289.9	13.8	231.9	11.0	58.0	2.8	13.8
Cat A-246	Off-Site to SE Corner - Via Creek	43.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	37.0	289.9	24.5	0	0	289.9	12.5	231.9	10.0	58.0	2.5	12.5
Cat A-247	Off-Site to SE Corner - Via Creek	25.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	22.2	289.9	14.7	0	0	289.9	7.5	231.9	6.0	58.0	1.5	7.5
Cat A-248	Off-Site to SE Corner - Via Creek	44.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	38.4	289.9	25.4	0	0	289.9	13.0	231.9	10.4	58.0	2.6	13.0
Cat A-249	Off-Site to SE Corner - Via Creek	18.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	16.2	289.9	10.7	0	0	289.9	5.5	231.9	4.4	58.0	1.1	5.5
Cat A-250	Off-Site to SE Corner - Via Creek	128.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	110.1	289.9	72.9	0	0	289.9	37.2	231.9	29.8	58.0	7.4	37.2
Cat A-251	Off-Site to SE Corner - Via Creek	28.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	24.5	289.9	16.2	0	0	289.9	8.3	231.9	6.6	58.0	1.7	8.3
Cat A-252	Off-Site to SE Corner - Via Creek	517.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	443.5	289.9	293.6	0	0	289.9	149.9	231.9	119.9	58.0	30.0	149.9
Cat A-254	Off-Site to SE Corner - Via Creek	2404.1	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	2062.0	283.9	1379.4	0	0	283.9	682.6	241.3	580.2	42.6	102.4	682.6
Cat A-288	Off-Site to SE Corner - Via Creek	1005.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	862.0	289.9	570.6	0	0	289.9	291.4	231.9	233.1	58.0	58.3	291.4
Cat A-289	Off-Site to SE Corner - Via Creek	2102.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	1803.1	289.9	1193.6	0	0	289.9	609.5	231.9	487.6	58.0	121.9	609.5
Cat A-290	Off-Site to SE Corner - Via Creek	266.6	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	228.6	283.9	152.9	0	0	283.9	75.7	241.3	64.3	42.6	11.4	75.7
Cat A-291	Off-Site to SE Corner - Via Creek	14.7	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	12.6	283.9	8.4	0	0	283.9	4.2	241.3	3.5	42.6	0.6	4.2
Cat A-292	Off-Site to SE Corner - Via Creek	27.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	23.4	283.9	15.7	0	0	283.9	7.8	241.3	6.6	42.6	1.2	7.8
Cat A-293	Off-Site to SE Corner - Via Creek	7.7	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	6.6	283.9	4.4	0	0	283.9	2.2	241.3	1.9	42.6	0.3	2.2
Cat A-294	Off-Site to SE Corner - Via Creek	61.2	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	52.5	283.9	35.1	0	0	283.9	17.4	241.3	14.8	42.6	2.6	17.4
Cat A-295	Off-Site to SE Corner - Via Creek	3.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	2.8	283.9	1.9	0	0	283.9	0.9	241.3	0.8	42.6	0.1	0.9
Cat A-296	Off-Site to SE Corner - Via Creek	52.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	44.9	283.9	30.0	0	0	283.9	14.8	241.3	12.6	42.6	2.2	14.8
Cat A-297	Off-Site to SE Corner - Via Creek	62.2	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	53.4	283.9	35.7	0	0	283.9	17.7	241.3	15.0	42.6	2.6	17.7
Cat A-298	Off-Site to SE Corner - Via Creek	47.9	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	41.1	283.9	27.5	0	0	283.9	13.6	241.3	11.6	42.6	2.0	13.6
Cat A-299	Off-Site to SE Corner - Via Creek	195.7	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	167.9	283.9	112.3	0	0	283.9	55.6	241.3	47.2	42.6	8.3	55.6
Cat A-300	Off-Site to SE Corner - Via Creek	174.0	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	149.2	283.9	99.8	0	0	283.9	49.4	241.3	42.0	42.6	7.4	49.4
Cat A-301	Off-Site to SE Corner - Via Creek	11.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	9.7	283.9	6.5	0	0	283.9	3.2	241.3	2.7	42.6	0.5	3.2
Cat A-302	Off-Site to SE Corner - Via Creek	8.5	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	7.3	283.9	4.9	0	0	283.9	2.4	241.3	2.1	42.6	0.4	2.4
Cat A-303	Off-Site to SE Corner - Via Creek	2.4	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	2.1	283.9	1.4	0	0	283.9	0.7	241.3	0.6	42.6	0.1	0.7
Cat A-304	Off-Site to SE Corner - Via Creek	45.0	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	38.6	283.9	25.8	0	0	283.9	12.8	241.3	10.9	42.6	1.9	12.8
Cat A-305	Off-Site to SE Corner - Via Creek	12.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	10.6	283.9	7.1	0	0	283.9	3.5	241.3	3.0	42.6	0.5	3.5
Cat A-306	Off-Site to SE Corner - Via Creek	82.6	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	70.8	283.9	47.4	0	0	283.9	23.5	241.3	19.9	42.6	3.5	23.5
Cat A-307	Off-Site to SE Corner - Via Creek	25.7	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	22.1	283.9	14.8	0	0	283.9	7.3	241.3	6.2	42.6	1.1	7.3
Cat A-308	Off-Site to SE Corner - Via Creek	1280.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	1098.1	283.9	734.6	0	0	283.9	363.5	241.3	309.0	42.6	54.5	363.5
Cat A-309	Off-Site to SE Corner - Via Creek	534.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	458.2	283.9	306.6	0	0	283.9	151.7	241.3	128.9	42.6	22.8	151.7
Cat A-310	Off-Site to SE Corner - Via Creek	76.7	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	65.8	283.9	44.0	0	0	283.9	21.8	241.3	18.5	42.6	3.3	21.8

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-311	Off-Site to SE Corner - Via Creek	10.8	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	9.3	283.9	6.2	0	0	283.9	3.1	241.3	2.6	42.6	0.5	3.1
Cat A-312	Off-Site to SE Corner - Via Creek	1634.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1402.0	292.9	923.2	0	0	292.9	478.8	219.7	359.1	73.2	119.7	478.8
Cat A-313	Off-Site to SE Corner - Via Creek	4730.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	4056.9	289.9	2685.6	0	0	289.9	1371.3	231.9	1097.0	58.0	274.3	1371.3
Cat A-314	Off-Site to SE Corner - Via Creek	220.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	189.0	289.9	125.1	0	0	289.9	63.9	231.9	51.1	58.0	12.8	63.9
Cat A-315	Off-Site to SE Corner - Via Creek	56.0	Lawns	0.05	Silt Loam	0.4	0.15	0.6	0.6	857.7	48.0	301.9	31.1	0	0	301.9	16.9	181.1	10.1	120.8	6.8	16.9
Cat A-316	Off-Site to SE Corner - Via Creek	1202.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	1031.7	289.9	683.0	0	0	289.9	348.7	231.9	279.0	58.0	69.7	348.7
Cat A-317	Off-Site to SE Corner - Via Creek	29.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	24.9	289.9	16.5	0	0	289.9	8.4	231.9	6.7	58.0	1.7	8.4
Cat A-318	Off-Site to SE Corner - Via Creek	14751.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	12652.6	292.9	8331.6	0	0	292.9	4321.0	219.7	3240.8	73.2	1080.3	4321.0
Cat A-319	Off-Site to SE Corner - Via Creek	1285.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1102.1	292.9	725.7	0	0	292.9	376.4	219.7	282.3	73.2	94.1	376.4
Cat A-320	Off-Site to SE Corner - Via Creek	13.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	11.4	292.9	7.5	0	0	292.9	3.9	219.7	2.9	73.2	1.0	3.9
Cat A-321	Off-Site to SE Corner - Via Creek	836.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	717.8	292.9	472.7	0	0	292.9	245.1	219.7	183.9	73.2	61.3	245.1
Cat A-322	Off-Site to SE Corner - Via Creek	70.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	60.5	292.9	39.8	0	0	292.9	20.6	219.7	15.5	73.2	5.2	20.6
Cat A-323	Off-Site to SE Corner - Via Creek	26591.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	22807.9	292.9	15018.7	0	0	292.9	7789.2	219.7	5841.9	73.2	1947.3	7789.2
Cat A-324	Off-Site to SE Corner - Via Creek	835.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	716.6	292.9	471.8	0	0	292.9	244.7	219.7	183.5	73.2	61.2	244.7
Cat A-325	Off-Site to SE Corner - Via Creek	293.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	251.8	292.9	165.8	0	0	292.9	86.0	219.7	64.5	73.2	21.5	86.0
Cat A-326	Off-Site to SE Corner - Via Creek	295.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	253.4	292.9	166.8	0	0	292.9	86.5	219.7	64.9	73.2	21.6	86.5
Cat A-327	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-328	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-329	Off-Site to SE Corner - Via Creek	7.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	6.4	292.9	4.2	0	0	292.9	2.2	219.7	1.6	73.2	0.5	2.2
Cat A-330	Off-Site to SE Corner - Via Creek	9.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	8.1	292.9	5.3	0	0	292.9	2.8	219.7	2.1	73.2	0.7	2.8
Cat A-331	Off-Site to SE Corner - Via Creek	89.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	77.0	292.9	50.7	0	0	292.9	26.3	219.7	19.7	73.2	6.6	26.3
Cat A-332	Off-Site to SE Corner - Via Creek	209.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	179.8	292.9	118.4	0	0	292.9	61.4	219.7	46.1	73.2	15.4	61.4
Cat A-333	Off-Site to SE Corner - Via Creek	352.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	302.0	292.9	198.9	0	0	292.9	103.2	219.7	77.4	73.2	25.8	103.2
Cat A-334	Off-Site to SE Corner - Via Creek	209.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	180.0	292.9	118.5	0	0	292.9	61.5	219.7	46.1	73.2	15.4	61.5
Cat A-335	Off-Site to SE Corner - Via Creek	53.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.8	292.9	30.2	0	0	292.9	15.6	219.7	11.7	73.2	3.9	15.6
Cat A-336	Off-Site to SE Corner - Via Creek	62.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	53.2	292.9	35.0	0	0	292.9	18.2	219.7	13.6	73.2	4.5	18.2
Cat A-337	Off-Site to SE Corner - Via Creek	24.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	21.3	292.9	14.0	0	0	292.9	7.3	219.7	5.4	73.2	1.8	7.3
Cat A-338	Off-Site to SE Corner - Via Creek	75.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	64.4	292.9	42.4	0	0	292.9	22.0	219.7	16.5	73.2	5.5	22.0
Cat A-339	Off-Site to SE Corner - Via Creek	57.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	49.1	292.9	32.4	0	0	292.9	16.8	219.7	12.6	73.2	4.2	16.8
Cat A-340	Off-Site to SE Corner - Via Creek	43.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	37.5	292.9	24.7	0	0	292.9	12.8	219.7	9.6	73.2	3.2	12.8
Cat A-341	Off-Site to SE Corner - Via Creek	43.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	37.1	292.9	24.4	0	0	292.9	12.7	219.7	9.5	73.2	3.2	12.7
Cat A-342	Off-Site to SE Corner - Via Creek	29.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	25.6	292.9	16.9	0	0	292.9	8.7	219.7	6.6	73.2	2.2	8.7
Cat A-343	Off-Site to SE Corner - Via Creek	13.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	11.5	292.9	7.6	0	0	292.9	3.9	219.7	2.9	73.2	1.0	3.9
Cat A-344	Off-Site to SE Corner - Via Creek	35.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	30.1	292.9	19.8	0	0	292.9	10.3	219.7	7.7	73.2	2.6	10.3
Cat A-345	Off-Site to SE Corner - Via Creek	22.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	19.4	292.9	12.8	0	0	292.9	6.6	219.7	5.0	73.2	1.7	6.6
Cat A-346	Off-Site to SE Corner - Via Creek	30.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	25.8	292.9	17.0	0	0	292.9	8.8	219.7	6.6	73.2	2.2	8.8
Cat A-347	Off-Site to SE Corner - Via Creek	22.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	19.2	292.9	12.6	0	0	292.9	6.6	219.7	4.9	73.2	1.6	6.6
Cat A-348	Off-Site to SE Corner - Via Creek	14.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	12.6	292.9	8.3	0	0	292.9	4.3	219.7	3.2	73.2	1.1	4.3
Cat A-349	Off-Site to SE Corner - Via Creek	9.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	8.1	292.9	5.3	0	0	292.9	2.8	219.7	2.1	73.2	0.7	2.8
Cat A-350	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-351	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-352	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-353	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-354	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-355	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-356	Off-Site to SE Corner - Via Creek	4.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	3.6	292.9	2.4	0	0	292.9	1.2	219.7	0.9	73.2	0.3	1.2
Cat A-357	Off-Site to SE Corner - Via Creek	81.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	69.6	292.9	45.8	0	0	292.9	23.8	219.7	17.8	73.2	5.9	23.8
Cat A-358	Off-Site to SE Corner - Via Creek	137.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	117.7	292.9	77.5	0	0	292.9	40.2	219.7	30.1	73.2	10.0	40.2
Cat A-359	Off-Site to SE Corner - Via Creek	136.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	117.4	292.9	77.3	0	0	292.9	40.1	219.7	30.1	73.2	10.0	40.1
Cat A-360	Off-Site to SE Corner - Via Creek	138.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	118.9	292.9	78.3	0	0	292.9	40.6	219.7	30.5	73.2	10.2	40.6
Cat A-361	Off-Site to SE Corner - Via Creek	130.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	112.0	292.9	73.8	0	0	292.9	38.3	219.7	28.7	73.2	9.6	38.3
Cat A-362	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-363	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-364	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-365	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-366	Off-Site to SE Corner - Via Creek	7.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	6.8	292.9	4.5	0	0	292.9	2.3	219.7	1.7	73.2	0.6	2.3
Cat A-367	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-368	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-369	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-370	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-371	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-372	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-373	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-374	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-375	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-376	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-377	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-378	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-379	Off-Site to SE Corner - Via Creek	46.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.9	292.9	26.3	0	0	292.9	13.6	219.7	10.2	73.2	3.4	13.6
Cat A-380	Off-Site to SE Corner - Via Creek	45.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.0	292.9	25.6	0	0	292.9	13.3	219.7	10.0	73.2	3.3	13.3
Cat A-381	Off-Site to SE Corner - Via Creek	47.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.4	292.9	26.6	0	0	292.9	13.8	219.7	10.3	73.2	3.4	13.8
Cat A-382	Off-Site to SE Corner - Via Creek	47.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.6	292.9	26.8	0	0	292.9	13.9	219.7	10.4	73.2	3.5	13.9
Cat A-383	Off-Site to SE Corner - Via Creek	51.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.3	292.9	29.2	0	0	292.9	15.1	219.7	11.3	73.2	3.8	15.1
Cat A-384	Off-Site to SE Corner - Via Creek	51.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.4	292.9	29.2	0	0	292.9	15.1	219.7	11.4	73.2	3.8	15.1
Cat A-385	Off-Site to SE Corner - Via Creek	47.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.5	292.9	26.7	0	0	292.9	13.8	219.7	10.4	73.2	3.5	13.8
Cat A-386	Off-Site to SE Corner - Via Creek	47.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.4	292.9	26.6	0	0	292.9	13.8	219.7	10.4	73.2	3.5	13.8
Cat A-387	Off-Site to SE Corner - Via Creek	51.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.4	292.9	29.2	0	0	292.9	15.2	219.7	11.4	73.2	3.8	15.2
Cat A-388	Off-Site to SE Corner - Via Creek	46.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.9	292.9	26.3	0	0	292.9	13.6	219.7	10.2	73.2	3.4	13.6
Cat A-389	Off-Site to SE Corner - Via Creek	54.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.8	292.9	30.8	0	0	292.9	16.0	219.7	12.0	73.2	4.0	16.0
Cat A-390	Off-Site to SE Corner - Via Creek	45.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.3	292.9	25.9	0	0	292.9	13.4	219.7	10.1	73.2	3.4	13.4
Cat A-391	Off-Site to SE Corner - Via Creek	37.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	32.0	292.9	21.1	0	0	292.9	10.9	219.7	8.2	73.2	2.7	10.9

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-392	Off-Site to SE Corner - Via Creek	40.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	34.6	292.9	22.8	0	0	292.9	11.8	219.7	8.9	73.2	3.0	11.8
Cat A-393	Off-Site to SE Corner - Via Creek	47.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.3	292.9	26.5	0	0	292.9	13.8	219.7	10.3	73.2	3.4	13.8
Cat A-394	Off-Site to SE Corner - Via Creek	47.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.8	292.9	26.9	0	0	292.9	13.9	219.7	10.5	73.2	3.5	13.9
Cat A-395	Off-Site to SE Corner - Via Creek	69.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	59.8	292.9	39.4	0	0	292.9	20.4	219.7	15.3	73.2	5.1	20.4
Cat A-396	Off-Site to SE Corner - Via Creek	1359.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1166.2	292.9	767.9	0	0	292.9	398.3	219.7	298.7	73.2	99.6	398.3
Cat A-397	Off-Site to SE Corner - Via Creek	56.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	48.6	292.9	32.0	0	0	292.9	16.6	219.7	12.4	73.2	4.1	16.6
Cat A-398	Off-Site to SE Corner - Via Creek	59.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	50.8	292.9	33.4	0	0	292.9	17.3	219.7	13.0	73.2	4.3	17.3
Cat A-399	Off-Site to SE Corner - Via Creek	58.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	50.1	292.9	33.0	0	0	292.9	17.1	219.7	12.8	73.2	4.3	17.1
Cat A-400	Off-Site to SE Corner - Via Creek	56.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	48.2	292.9	31.7	0	0	292.9	16.4	219.7	12.3	73.2	4.1	16.4
Cat A-401	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-402	Off-Site to SE Corner - Via Creek	171.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	147.0	292.9	96.8	0	0	292.9	50.2	219.7	37.7	73.2	12.6	50.2
Cat A-403	Off-Site to SE Corner - Via Creek	56.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	48.8	292.9	32.2	0	0	292.9	16.7	219.7	12.5	73.2	4.2	16.7
Cat A-404	Off-Site to SE Corner - Via Creek	59.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	51.3	292.9	33.8	0	0	292.9	17.5	219.7	13.2	73.2	4.4	17.5
Cat A-405	Off-Site to SE Corner - Via Creek	58.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	50.5	292.9	33.2	0	0	292.9	17.2	219.7	12.9	73.2	4.3	17.2
Cat A-406	Off-Site to SE Corner - Via Creek	96.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	82.4	292.9	54.3	0	0	292.9	28.1	219.7	21.1	73.2	7.0	28.1
Cat A-407	Off-Site to SE Corner - Via Creek	2.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1.9	292.9	1.3	0	0	292.9	0.7	219.7	0.5	73.2	0.2	0.7
Cat A-408	Off-Site to SE Corner - Via Creek	18.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	16.0	292.9	10.6	0	0	292.9	5.5	219.7	4.1	73.2	1.4	5.5
Cat A-409	Off-Site to SE Corner - Via Creek	5.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	4.8	292.9	3.2	0	0	292.9	1.6	219.7	1.2	73.2	0.4	1.6
Cat A-410	Off-Site to SE Corner - Via Creek	11.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.6	292.9	6.3	0	0	292.9	3.3	219.7	2.5	73.2	0.8	3.3
Cat A-411	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-412	Off-Site to SE Corner - Via Creek	10.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.0	292.9	6.0	0	0	292.9	3.1	219.7	2.3	73.2	0.8	3.1
Cat A-413	Off-Site to SE Corner - Via Creek	2.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1.7	292.9	1.1	0	0	292.9	0.6	219.7	0.4	73.2	0.1	0.6
Cat A-414	Off-Site to SE Corner - Via Creek	1.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1.5	292.9	1.0	0	0	292.9	0.5	219.7	0.4	73.2	0.1	0.5
Cat A-415	Off-Site to SE Corner - Via Creek	38.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	33.0	292.9	21.7	0	0	292.9	11.3	219.7	8.4	73.2	2.8	11.3
Cat A-416	Off-Site to SE Corner - Via Creek	47.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.7	292.9	26.8	0	0	292.9	13.9	219.7	10.4	73.2	3.5	13.9
Cat A-417	Off-Site to SE Corner - Via Creek	45.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	38.8	292.9	25.5	0	0	292.9	13.2	219.7	9.9	73.2	3.3	13.2
Cat A-418	Off-Site to SE Corner - Via Creek	51.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.8	292.9	28.9	0	0	292.9	15.0	219.7	11.2	73.2	3.7	15.0
Cat A-419	Off-Site to SE Corner - Via Creek	49.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	42.3	292.9	27.9	0	0	292.9	14.5	219.7	10.8	73.2	3.6	14.5
Cat A-420	Off-Site to SE Corner - Via Creek	46.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.6	292.9	26.1	0	0	292.9	13.5	219.7	10.1	73.2	3.4	13.5
Cat A-421	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-422	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-423	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-424	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-425	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-426	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-427	Off-Site to SE Corner - Via Creek	49.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	42.8	292.9	28.2	0	0	292.9	14.6	219.7	11.0	73.2	3.7	14.6
Cat A-428	Off-Site to SE Corner - Via Creek	70.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	60.3	292.9	39.7	0	0	292.9	20.6	219.7	15.5	73.2	5.2	20.6
Cat A-429	Off-Site to SE Corner - Via Creek	100.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	86.2	292.9	56.8	0	0	292.9	29.5	219.7	22.1	73.2	7.4	29.5
Cat A-430	Off-Site to SE Corner - Via Creek	126.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	108.2	292.9	71.3	0	0	292.9	37.0	219.7	27.7	73.2	9.2	37.0
Cat A-431	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-432	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-433	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-434	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-435	Off-Site to SE Corner - Via Creek	162.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	138.9	292.9	91.5	0	0	292.9	47.4	219.7	35.6	73.2	11.9	47.4
Cat A-436	Off-Site to SE Corner - Via Creek	139.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	119.6	292.9	78.7	0	0	292.9	40.8	219.7	30.6	73.2	10.2	40.8
Cat A-437	Off-Site to SE Corner - Via Creek	44.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	38.0	292.9	25.0	0	0	292.9	13.0	219.7	9.7	73.2	3.2	13.0
Cat A-438	Off-Site to SE Corner - Via Creek	4.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	4.2	292.9	2.7	0	0	292.9	1.4	219.7	1.1	73.2	0.4	1.4
Cat A-439	Off-Site to SE Corner - Via Creek	3.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	2.6	292.9	1.7	0	0	292.9	0.9	219.7	0.7	73.2	0.2	0.9
Cat A-440	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-441	Off-Site to SE Corner - Via Creek	73.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	63.2	292.9	41.6	0	0	292.9	21.6	219.7	16.2	73.2	5.4	21.6
Cat A-442	Off-Site to SE Corner - Via Creek	77.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	66.2	292.9	43.6	0	0	292.9	22.6	219.7	16.9	73.2	5.6	22.6
Cat A-443	Off-Site to SE Corner - Via Creek	79.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	67.9	292.9	44.7	0	0	292.9	23.2	219.7	17.4	73.2	5.8	23.2
Cat A-444	Off-Site to SE Corner - Via Creek	80.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	69.2	292.9	45.6	0	0	292.9	23.6	219.7	17.7	73.2	5.9	23.6
Cat A-445	Off-Site to SE Corner - Via Creek	78.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	67.5	292.9	44.4	0	0	292.9	23.0	219.7	17.3	73.2	5.8	23.0
Cat A-446	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-447	Off-Site to SE Corner - Via Creek	298.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	256.0	292.9	168.5	0	0	292.9	87.4	219.7	65.6	73.2	21.9	87.4
Cat A-448	Off-Site to SE Corner - Via Creek	294.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	252.4	292.9	166.2	0	0	292.9	86.2	219.7	64.6	73.2	21.5	86.2
Cat A-449	Off-Site to SE Corner - Via Creek	217.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	186.4	292.9	122.7	0	0	292.9	63.7	219.7	47.7	73.2	15.9	63.7
Cat A-450	Off-Site to SE Corner - Via Creek	161.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	138.3	292.9	91.1	0	0	292.9	47.2	219.7	35.4	73.2	11.8	47.2
Cat A-451	Off-Site to SE Corner - Via Creek	161.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	138.5	292.9	91.2	0	0	292.9	47.3	219.7	35.5	73.2	11.8	47.3
Cat A-452	Off-Site to SE Corner - Via Creek	159.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	137.0	292.9	90.2	0	0	292.9	46.8	219.7	35.1	73.2	11.7	46.8
Cat A-453	Off-Site to SE Corner - Via Creek	167.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	143.9	292.9	94.8	0	0	292.9	49.1	219.7	36.9	73.2	12.3	49.1
Cat A-454	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-455	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-456	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-457	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-458	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-459	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-460	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-461	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-462	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-463	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-464	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-465	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-466	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-467	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-468	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-469	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-470	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-471	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-472	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-473	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-474	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-475	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-476	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-477	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-478	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-479	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-480	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-481	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-482	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-483	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-484	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-485	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-486	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-487	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-488	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-489	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-490	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-491	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-492	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-493	Off-Site to SE Corner - Via Creek	10.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	8.6	292.9	5.7	0	0	292.9	2.9	219.7	2.2	73.2	0.7	2.9
Cat A-494	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-495	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-496	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-497	Off-Site to SE Corner - Via Creek	9.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	8.1	292.9	5.4	0	0	292.9	2.8	219.7	2.1	73.2	0.7	2.8
Cat A-498	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-499	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-500	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-501	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-502	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-503	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-504	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-505	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-506	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-507	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-508	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-509	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-510	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-511	Off-Site to SE Corner - Via Creek	52.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.3	292.9	29.8	0	0	292.9	15.5	219.7	11.6	73.2	3.9	15.5
Cat A-512	Off-Site to SE Corner - Via Creek	44.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	37.8	292.9	24.9	0	0	292.9	12.9	219.7	9.7	73.2	3.2	12.9
Cat A-513	Off-Site to SE Corner - Via Creek	45.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.1	292.9	25.7	0	0	292.9	13.3	219.7	10.0	73.2	3.3	13.3
Cat A-514	Off-Site to SE Corner - Via Creek	53.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.8	292.9	30.1	0	0	292.9	15.6	219.7	11.7	73.2	3.9	15.6
Cat A-515	Off-Site to SE Corner - Via Creek	52.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.6	292.9	29.4	0	0	292.9	15.2	219.7	11.4	73.2	3.8	15.2
Cat A-516	Off-Site to SE Corner - Via Creek	49.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	42.3	292.9	27.9	0	0	292.9	14.5	219.7	10.8	73.2	3.6	14.5
Cat A-517	Off-Site to SE Corner - Via Creek	45.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	38.9	292.9	25.6	0	0	292.9	13.3	219.7	10.0	73.2	3.3	13.3
Cat A-518	Off-Site to SE Corner - Via Creek	46.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.3	292.9	26.5	0	0	292.9	13.7	219.7	10.3	73.2	3.4	13.7
Cat A-519	Off-Site to SE Corner - Via Creek	48.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	41.2	292.9	27.1	0	0	292.9	14.1	219.7	10.6	73.2	3.5	14.1
Cat A-520	Off-Site to SE Corner - Via Creek	45.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.2	292.9	25.8	0	0	292.9	13.4	219.7	10.0	73.2	3.3	13.4
Cat A-521	Off-Site to SE Corner - Via Creek	44.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	38.4	292.9	25.3	0	0	292.9	13.1	219.7	9.8	73.2	3.3	13.1
Cat A-522	Off-Site to SE Corner - Via Creek	45.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.1	292.9	25.7	0	0	292.9	13.3	219.7	10.0	73.2	3.3	13.3
Cat A-523	Off-Site to SE Corner - Via Creek	46.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.0	292.9	26.4	0	0	292.9	13.7	219.7	10.3	73.2	3.4	13.7
Cat A-524	Off-Site to SE Corner - Via Creek	45.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	38.9	292.9	25.6	0	0	292.9	13.3	219.7	10.0	73.2	3.3	13.3
Cat A-525	Off-Site to SE Corner - Via Creek	56.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	48.2	292.9	31.7	0	0	292.9	16.5	219.7	12.3	73.2	4.1	16.5
Cat A-526	Off-Site to SE Corner - Via Creek	46.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.9	292.9	26.2	0	0	292.9	13.6	219.7	10.2	73.2	3.4	13.6
Cat A-527	Off-Site to SE Corner - Via Creek	46.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.5	292.9	26.0	0	0	292.9	13.5	219.7	10.1	73.2	3.4	13.5
Cat A-528	Off-Site to SE Corner - Via Creek	46.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.7	292.9	26.2	0	0	292.9	13.6	219.7	10.2	73.2	3.4	13.6
Cat A-529	Off-Site to SE Corner - Via Creek	37.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	32.2	292.9	21.2	0	0	292.9	11.0	219.7	8.2	73.2	2.7	11.0
Cat A-530	Off-Site to SE Corner - Via Creek	43.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	37.4	292.9	24.6	0	0	292.9	12.8	219.7	9.6	73.2	3.2	12.8
Cat A-531	Off-Site to SE Corner - Via Creek	43.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	37.6	292.9	24.8	0	0	292.9	12.8	219.7	9.6	73.2	3.2	12.8
Cat A-532	Off-Site to SE Corner - Via Creek	40.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	34.8	292.9	22.9	0	0	292.9	11.9	219.7	8.9	73.2	3.0	11.9
Cat A-533	Off-Site to SE Corner - Via Creek	41.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	35.7	292.9	23.5	0	0	292.9	12.2	219.7	9.1	73.2	3.0	12.2
Cat A-534	Off-Site to SE Corner - Via Creek	52.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.3	292.9	29.9	0	0	292.9	15.5	219.7	11.6	73.2	3.9	15.5
Cat A-535	Off-Site to SE Corner - Via Creek	51.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.4	292.9	29.2	0	0	292.9	15.2	219.7	11.4	73.2	3.8	15.2
Cat A-536	Off-Site to SE Corner - Via Creek	44.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	38.4	292.9	25.3	0	0	292.9	13.1	219.7	9.8	73.2	3.3	13.1
Cat A-537	Off-Site to SE Corner - Via Creek	44.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	38.3	292.9	25.2	0	0	292.9	13.1	219.7	9.8	73.2	3.3	13.1
Cat A-538	Off-Site to SE Corner - Via Creek	44.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	37.7	292.9	24.8	0	0	292.9	12.9	219.7	9.7	73.2	3.2	12.9
Cat A-539	Off-Site to SE Corner - Via Creek	54.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.5	292.9	30.6	0	0	292.9	15.9	219.7	11.9	73.2	4.0	15.9
Cat A-540	Off-Site to SE Corner - Via Creek	56.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	48.3	292.9	31.8	0	0	292.9	16.5	219.7	12.4	73.2	4.1	16.5
Cat A-541	Off-Site to SE Corner - Via Creek	41.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	35.5	292.9	23.4	0	0	292.9	12.1	219.7	9.1	73.2	3.0	12.1
Cat A-542	Off-Site to SE Corner - Via Creek	43.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	36.9	292.9	24.3	0	0	292.9	12.6	219.7	9.4	73.2	3.1	12.6
Cat A-543	Off-Site to SE Corner - Via Creek	41.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	35.2	292.9	23.2	0	0	292.9	12.0	219.7	9.0	73.2	3.0	12.0
Cat A-544	Off-Site to SE Corner - Via Creek	53.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.2	292.9	30.4	0	0	292.9	15.8	219.7	11.8	73.2	3.9	15.8
Cat A-545	Off-Site to SE Corner - Via Creek	53.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.1	292.9	30.4	0	0	292.9	15.7	219.7	11.8	73.2	3.9	15.7
Cat A-546	Off-Site to SE Corner - Via Creek	56.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	48.1	292.9	31.7	0	0	292.9	16.4	219.7	12.3	73.2	4.1	16.4
Cat A-547	Off-Site to SE Corner - Via Creek	53.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.6	292.9	30.0	0	0	292.9	15.6	219.7	11.7	73.2	3.9	15.6
Cat A-548	Off-Site to SE Corner - Via Creek	40.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	34.8	292.9	22.9	0	0	292.9	11.9	219.7	8.9	73.2	3.0	11.9
Cat A-549	Off-Site to SE Corner - Via Creek	41.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	35.2	292.9	23.2	0	0	292.9	12.0	219.7	9.0	73.2	3.0	12.0
Cat A-550	Off-Site to SE Corner - Via Creek	42.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	36.8	292.9	24.2	0	0	292.9	12.6	219.7	9.4	73.2	3.1	12.6
Cat A-551	Off-Site to SE Corner - Via Creek	41.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	35.3	292.9	23.2	0	0	292.9	12.1	219.7	9.0	73.2	3.0	12.1
Cat A-552	Off-Site to SE Corner - Via Creek	50.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.3	292.9	28.5	0	0	292.9	14.8	219.7	11.1	73.2	3.7	14.8
Cat A-553	Off-Site to SE Corner - Via Creek	52.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.2	292.9	29.7	0	0	292.9	15.4	219.7	11.6	73.2	3.9	15.4

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-554	Off-Site to SE Corner - Via Creek	54.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.7	292.9	30.8	0	0	292.9	16.0	219.7	12.0	73.2	4.0	16.0
Cat A-555	Off-Site to SE Corner - Via Creek	55.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	47.2	292.9	31.1	0	0	292.9	16.1	219.7	12.1	73.2	4.0	16.1
Cat A-556	Off-Site to SE Corner - Via Creek	54.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.6	292.9	30.7	0	0	292.9	15.9	219.7	11.9	73.2	4.0	15.9
Cat A-557	Off-Site to SE Corner - Via Creek	50.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.0	292.9	28.3	0	0	292.9	14.7	219.7	11.0	73.2	3.7	14.7
Cat A-558	Off-Site to SE Corner - Via Creek	37.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	31.7	292.9	20.9	0	0	292.9	10.8	219.7	8.1	73.2	2.7	10.8
Cat A-559	Off-Site to SE Corner - Via Creek	36.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	31.4	292.9	20.7	0	0	292.9	10.7	219.7	8.0	73.2	2.7	10.7
Cat A-560	Off-Site to SE Corner - Via Creek	52.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.2	292.9	29.8	0	0	292.9	15.4	219.7	11.6	73.2	3.9	15.4
Cat A-561	Off-Site to SE Corner - Via Creek	45.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.0	292.9	25.7	0	0	292.9	13.3	219.7	10.0	73.2	3.3	13.3
Cat A-562	Off-Site to SE Corner - Via Creek	63.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	54.8	292.9	36.1	0	0	292.9	18.7	219.7	14.0	73.2	4.7	18.7
Cat A-563	Off-Site to SE Corner - Via Creek	36.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	31.6	292.9	20.8	0	0	292.9	10.8	219.7	8.1	73.2	2.7	10.8
Cat A-564	Off-Site to SE Corner - Via Creek	54.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.5	292.9	30.6	0	0	292.9	15.9	219.7	11.9	73.2	4.0	15.9
Cat A-565	Off-Site to SE Corner - Via Creek	52.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.3	292.9	29.9	0	0	292.9	15.5	219.7	11.6	73.2	3.9	15.5
Cat A-566	Off-Site to SE Corner - Via Creek	50.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.2	292.9	28.4	0	0	292.9	14.7	219.7	11.1	73.2	3.7	14.7
Cat A-567	Off-Site to SE Corner - Via Creek	52.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.8	292.9	29.5	0	0	292.9	15.3	219.7	11.5	73.2	3.8	15.3
Cat A-568	Off-Site to SE Corner - Via Creek	51.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.2	292.9	29.1	0	0	292.9	15.1	219.7	11.3	73.2	3.8	15.1
Cat A-569	Off-Site to SE Corner - Via Creek	4680.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	4014.7	292.9	2643.7	0	0	292.9	1371.1	219.7	1028.3	73.2	342.8	1371.1
Cat A-570	Off-Site to SE Corner - Via Creek	136.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	116.8	292.9	76.9	0	0	292.9	39.9	219.7	29.9	73.2	10.0	39.9
Cat A-571	Off-Site to SE Corner - Via Creek	296.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	254.3	292.9	167.4	0	0	292.9	86.8	219.7	65.1	73.2	21.7	86.8
Cat A-572	Off-Site to SE Corner - Via Creek	296.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	254.4	292.9	167.5	0	0	292.9	86.9	219.7	65.2	73.2	21.7	86.9
Cat A-573	Off-Site to SE Corner - Via Creek	287.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	246.8	292.9	162.5	0	0	292.9	84.3	219.7	63.2	73.2	21.1	84.3
Cat A-574	Off-Site to SE Corner - Via Creek	260.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	223.0	292.9	146.8	0	0	292.9	76.2	219.7	57.1	73.2	19.0	76.2
Cat A-575	Off-Site to SE Corner - Via Creek	251.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	215.2	292.9	141.7	0	0	292.9	73.5	219.7	55.1	73.2	18.4	73.5
Cat A-576	Off-Site to SE Corner - Via Creek	253.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	217.2	292.9	143.0	0	0	292.9	74.2	219.7	55.6	73.2	18.5	74.2
Cat A-577	Off-Site to SE Corner - Via Creek	247.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	212.1	292.9	139.7	0	0	292.9	72.4	219.7	54.3	73.2	18.1	72.4
Cat A-578	Off-Site to SE Corner - Via Creek	249.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	213.6	292.9	140.7	0	0	292.9	73.0	219.7	54.7	73.2	18.2	73.0
Cat A-579	Off-Site to SE Corner - Via Creek	252.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	216.3	292.9	142.5	0	0	292.9	73.9	219.7	55.4	73.2	18.5	73.9
Cat A-580	Off-Site to SE Corner - Via Creek	248.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	213.1	292.9	140.3	0	0	292.9	72.8	219.7	54.6	73.2	18.2	72.8
Cat A-581	Off-Site to SE Corner - Via Creek	228.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	195.6	292.9	128.8	0	0	292.9	66.8	219.7	50.1	73.2	16.7	66.8
Cat A-582	Off-Site to SE Corner - Via Creek	197.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	169.7	292.9	111.8	0	0	292.9	58.0	219.7	43.5	73.2	14.5	58.0
Cat A-583	Off-Site to SE Corner - Via Creek	172.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	147.7	292.9	97.3	0	0	292.9	50.4	219.7	37.8	73.2	12.6	50.4
Cat A-584	Off-Site to SE Corner - Via Creek	136.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	117.0	292.9	77.1	0	0	292.9	40.0	219.7	30.0	73.2	10.0	40.0
Cat A-585	Off-Site to SE Corner - Via Creek	159.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	136.4	292.9	89.8	0	0	292.9	46.6	219.7	34.9	73.2	11.6	46.6
Cat A-586	Off-Site to SE Corner - Via Creek	254.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	218.0	292.9	143.5	0	0	292.9	74.4	219.7	55.8	73.2	18.6	74.4
Cat A-587	Off-Site to SE Corner - Via Creek	9.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	8.0	292.9	5.3	0	0	292.9	2.7	219.7	2.1	73.2	0.7	2.7
Cat A-588	Off-Site to SE Corner - Via Creek	9.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	8.2	292.9	5.4	0	0	292.9	2.8	219.7	2.1	73.2	0.7	2.8
Cat A-589	Off-Site to SE Corner - Via Creek	127.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	108.9	292.9	71.7	0	0	292.9	37.2	219.7	27.9	73.2	9.3	37.2
Cat A-590	Off-Site to SE Corner - Via Creek	203.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	174.5	292.9	114.9	0	0	292.9	59.6	219.7	44.7	73.2	14.9	59.6
Cat A-591	Off-Site to SE Corner - Via Creek	224.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	192.7	292.9	126.9	0	0	292.9	65.8	219.7	49.4	73.2	16.5	65.8
Cat A-592	Off-Site to SE Corner - Via Creek	221.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	189.8	292.9	125.0	0	0	292.9	64.8	219.7	48.6	73.2	16.2	64.8
Cat A-593	Off-Site to SE Corner - Via Creek	219.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	188.0	292.9	123.8	0	0	292.9	64.2	219.7	48.2	73.2	16.1	64.2
Cat A-594	Off-Site to SE Corner - Via Creek	217.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	186.8	292.9	123.0	0	0	292.9	63.8	219.7	47.8	73.2	15.9	63.8
Cat A-595	Off-Site to SE Corner - Via Creek	219.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	188.5	292.9	124.1	0	0	292.9	64.4	219.7	48.3	73.2	16.1	64.4
Cat A-596	Off-Site to SE Corner - Via Creek	241.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	207.4	292.9	136.5	0	0	292.9	70.8	219.7	53.1	73.2	17.7	70.8
Cat A-597	Off-Site to SE Corner - Via Creek	239.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	205.2	292.9	135.1	0	0	292.9	70.1	219.7	52.6	73.2	17.5	70.1
Cat A-598	Off-Site to SE Corner - Via Creek	240.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	205.9	292.9	135.6	0	0	292.9	70.3	219.7	52.7	73.2	17.6	70.3
Cat A-599	Off-Site to SE Corner - Via Creek	242.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	207.8	292.9	136.8	0	0	292.9	71.0	219.7	53.2	73.2	17.7	71.0
Cat A-600	Off-Site to SE Corner - Via Creek	241.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	207.1	292.9	136.4	0	0	292.9	70.7	219.7	53.1	73.2	17.7	70.7
Cat A-601	Off-Site to SE Corner - Via Creek	238.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	204.6	292.9	134.7	0	0	292.9	69.9	219.7	52.4	73.2	17.5	69.9
Cat A-602	Off-Site to SE Corner - Via Creek	239.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	205.5	292.9	135.3	0	0	292.9	70.2	219.7	52.6	73.2	17.5	70.2
Cat A-603	Off-Site to SE Corner - Via Creek	241.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	206.8	292.9	136.2	0	0	292.9	70.6	219.7	53.0	73.2	17.7	70.6
Cat A-604	Off-Site to SE Corner - Via Creek	254.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	218.5	292.9	143.9	0	0	292.9	74.6	219.7	56.0	73.2	18.7	74.6
Cat A-605	Off-Site to SE Corner - Via Creek	255.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	218.9	292.9	144.1	0	0	292.9	74.7	219.7	56.1	73.2	18.7	74.7
Cat A-606	Off-Site to SE Corner - Via Creek	268.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	230.3	292.9	151.7	0	0	292.9	78.7	219.7	59.0	73.2	19.7	78.7
Cat A-607	Off-Site to SE Corner - Via Creek	285.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	244.5	292.9	161.0	0	0	292.9	83.5	219.7	62.6	73.2	20.9	83.5
Cat A-608	Off-Site to SE Corner - Via Creek	263.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	225.9	292.9	148.7	0	0	292.9	77.1	219.7	57.9	73.2	19.3	77.1
Cat A-609	Off-Site to SE Corner - Via Creek	275.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	236.6	292.9	155.8	0	0	292.9	80.8	219.7	60.6	73.2	20.2	80.8
Cat A-610	Off-Site to SE Corner - Via Creek	268.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	230.1	292.9	151.5	0	0	292.9	78.6	219.7	58.9	73.2	19.6	78.6
Cat A-611	Off-Site to SE Corner - Via Creek	276.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	236.8	292.9	155.9	0	0	292.9	80.9	219.7	60.6	73.2	20.2	80.9
Cat A-612	Off-Site to SE Corner - Via Creek	283.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	243.3	292.9	160.2	0	0	292.9	83.1	219.7	62.3	73.2	20.8	83.1
Cat A-613	Off-Site to SE Corner - Via Creek	284.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	243.9	292.9	160.6	0	0	292.9	83.3	219.7	62.5	73.2	20.8	83.3
Cat A-614	Off-Site to SE Corner - Via Creek	3.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	2.6	292.9	1.7	0	0	292.9	0.9	219.7	0.7	73.2	0.2	0.9
Cat A-615	Off-Site to SE Corner - Via Creek	2.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1.8	292.9	1.2	0	0	292.9	0.6	219.7	0.5	73.2	0.2	0.6
Cat A-616	Off-Site to SE Corner - Via Creek	72.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	62.4	292.9	41.1	0	0	292.9	21.3	219.7	16.0	73.2	5.3	21.3
Cat A-617	Off-Site to SE Corner - Via Creek	91.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	78.8	292.9	51.9	0	0	292.9	26.9	219.7	20.2	73.2	6.7	26.9
Cat A-618	Off-Site to SE Corner - Via Creek	279.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	239.9	292.9	158.0	0	0	292.9	81.9	219.7	61.5	73.2	20.5	81.9
Cat A-619	Off-Site to SE Corner - Via Creek	292.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	251.1	292.9	165.4	0	0	292.9	85.8	219.7	64.3	73.2	21.4	85.8
Cat A-620	Off-Site to SE Corner - Via Creek	287.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	246.4	292.9	162.2	0	0	292.9	84.1	219.7	63.1	73.2	21.0	84.1
Cat A-621	Off-Site to SE Corner - Via Creek	287.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	246.9	292.9	162.6	0	0	292.9	84.3	219.7	63.2	73.2	21.1	84.3
Cat A-622	Off-Site to SE Corner - Via Creek	10.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.3	292.9	6.1	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-623	Off-Site to SE Corner - Via Creek	7.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	6.7	292.9	4.4	0	0	292.9	2.3	219.7	1.7	73.2	0.6	2.3
Cat A-624	Off-Site to SE Corner - Via Creek	2.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	2.3	292.9	1.5	0	0	292.9	0.8	219.7	0.6	73.2	0.2	0.8
Cat A-625	Off-Site to SE Corner - Via Creek	3.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	2.8	292.9	1.8	0	0	292.9	1.0	219.7	0.7	73.2	0.2	1.0
Cat A-626	Off-Site to SE Corner - Via Creek	13.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	11.7	292.9	7.7	0	0	292.9	4.0	219.7	3.0	73.2	1.0	4.0
Cat A-627	Off-Site to SE Corner - Via Creek	330.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	283.7	292.9	186.8	0	0	292.9	96.9	219.7	72.7	73.2	24.2	96.9
Cat A-628	Off-Site to SE Corner - Via Creek	164.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	140.8	292.9	92.7	0	0	292.9	48.1	219.7	36.1	73.2	12.0	48.1
Cat A-629	Off-Site to SE Corner - Via Creek	132.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	113.8	292.9	75.0	0	0	292.9	38.9	219.7	29.2	73.2	9.7	38.9
Cat A-630	Off-Site to SE Corner - Via Creek	66.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	56.7	292.9	37.3	0	0	292.9	19.4	219.7	14.5	73.2	4.8	19.4
Cat A-631	Off-Site to SE Corner - Via Creek	2037.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1747.3	292.9	1150.6	0	0	292.9	596.7	219.7	447.5	73.2	149.2	596.7
Cat A-632	Off-Site to SE Corner - Via Creek	1140.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	977.9	292.9	644.0	0	0	292.9	334.0	219.7	250.5	73.2	83.5	334.0
Cat A-633	Off-Site to SE Corner - Via Creek	804.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	690.0	292.9	454.3	0	0	292.9	235.6	219.7	176.7	73.2	58.9	235.6
Cat A-634	Off-Site to SE Corner - Via Creek	12.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	10.7	292.9	7.0	0	0	292.9	3.6	219.7	2.7	73.2	0.9	3.6

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-635	Off-Site to SE Corner - Via Creek	1776.6	Ponds	1	Silt Loam	0.4	0.25	1.65	1	857.7	1523.8	211.7	1147.7	0	0	211.7	376.1	211.7	376.1	0.0	0.0	376.1
Cat A-636	Off-Site to SE Corner - Via Creek	1808.8	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	1551.4	283.9	1037.9	0	0	283.9	513.6	241.3	436.5	42.6	77.0	513.6
Cat A-637	Off-Site to SE Corner - Via Creek	355.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	305.1	289.9	202.0	0	0	289.9	103.1	231.9	82.5	58.0	20.6	103.1
Cat A-638	Off-Site to SE Corner - Via Creek	277.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	238.4	289.9	157.8	0	0	289.9	80.6	231.9	64.5	58.0	16.1	80.6
Cat A-639	Off-Site to SE Corner - Via Creek	17.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	15.3	289.9	10.1	0	0	289.9	5.2	231.9	4.1	58.0	1.0	5.2
Cat A-640	Off-Site to SE Corner - Via Creek	30.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	26.4	289.9	17.5	0	0	289.9	8.9	231.9	7.1	58.0	1.8	8.9
Cat A-641	Off-Site to SE Corner - Via Creek	453.4	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	388.8	283.9	260.1	0	0	283.9	128.7	212.9	96.5	71.0	32.2	128.7
Cat A-642	Off-Site to SE Corner - Via Creek	101.6	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	87.1	283.9	58.3	0	0	283.9	28.8	212.9	21.6	71.0	7.2	28.8
Cat A-643	Off-Site to SE Corner - Via Creek	10.2	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	8.7	283.9	5.8	0	0	283.9	2.9	212.9	2.2	71.0	0.7	2.9
Cat A-644	Off-Site to SE Corner - Via Creek	37.8	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	32.5	283.9	21.7	0	0	283.9	10.7	212.9	8.1	71.0	2.7	10.7
Cat A-645	Off-Site to SE Corner - Via Creek	258.3	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	221.5	283.9	148.2	0	0	283.9	73.3	212.9	55.0	71.0	18.3	73.3
Cat A-646	Off-Site to SE Corner - Via Creek	274.9	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	235.8	283.9	157.7	0	0	283.9	78.0	212.9	58.5	71.0	19.5	78.0
Cat A-647	Off-Site to SE Corner - Via Creek	45.4	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	39.0	283.9	26.1	0	0	283.9	12.9	212.9	9.7	71.0	3.2	12.9
Cat A-648	Off-Site to SE Corner - Via Creek	30.7	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	26.3	283.9	17.6	0	0	283.9	8.7	212.9	6.5	71.0	2.2	8.7
Cat A-649	Off-Site to SE Corner - Via Creek	28.9	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	24.8	283.9	16.6	0	0	283.9	8.2	212.9	6.1	71.0	2.0	8.2
Cat A-650	Off-Site to SE Corner - Via Creek	23.5	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	20.2	283.9	13.5	0	0	283.9	6.7	212.9	5.0	71.0	1.7	6.7
Cat A-651	Off-Site to SE Corner - Via Creek	161.8	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	138.8	283.9	92.9	0	0	283.9	46.0	212.9	34.5	71.0	11.5	46.0
Cat A-652	Off-Site to SE Corner - Via Creek	10.9	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	9.3	283.9	6.3	0	0	283.9	3.1	212.9	2.3	71.0	0.8	3.1
Cat A-653	Off-Site to SE Corner - Via Creek	10.9	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	9.3	283.9	6.3	0	0	283.9	3.1	212.9	2.3	71.0	0.8	3.1
Cat A-654	Off-Site to SE Corner - Via Creek	10.9	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	9.3	283.9	6.3	0	0	283.9	3.1	212.9	2.3	71.0	0.8	3.1
Cat A-655	Off-Site to SE Corner - Via Creek	40.0	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	34.3	283.9	22.9	0	0	283.9	11.3	212.9	8.5	71.0	2.8	11.3
Cat A-656	Off-Site to SE Corner - Via Creek	57.3	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	49.1	283.9	32.9	0	0	283.9	16.3	212.9	12.2	71.0	4.1	16.3
Cat A-657	Off-Site to SE Corner - Via Creek	52.4	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	45.0	283.9	30.1	0	0	283.9	14.9	212.9	11.2	71.0	3.7	14.9
Cat A-658	Off-Site to SE Corner - Via Creek	909.2	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	779.9	283.9	521.7	0	0	283.9	258.1	212.9	193.6	71.0	64.5	258.1
Cat A-659	Off-Site to SE Corner - Via Creek	23.8	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	20.4	283.9	13.7	0	0	283.9	6.8	212.9	5.1	71.0	1.7	6.8
Cat A-660	Off-Site to SE Corner - Via Creek	249.1	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	213.6	283.9	142.9	0	0	283.9	70.7	212.9	53.0	71.0	17.7	70.7
Cat A-661	Off-Site to SE Corner - Via Creek	3.1	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	2.7	283.9	1.8	0	0	283.9	0.9	212.9	0.7	71.0	0.2	0.9
Cat A-662	Off-Site to SE Corner - Via Creek	509.6	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	437.1	292.9	287.8	0	0	292.9	149.3	190.4	97.0	102.5	52.2	149.3
Cat A-663	Off-Site to SE Corner - Via Creek	41.6	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	35.7	292.9	23.5	0	0	292.9	12.2	190.4	7.9	102.5	4.3	12.2
Cat A-664	Off-Site to SE Corner - Via Creek	286.0	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	245.3	292.9	161.5	0	0	292.9	83.8	190.4	54.5	102.5	29.3	83.8
Cat A-665	Off-Site to SE Corner - Via Creek	278.4	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	238.8	292.9	157.3	0	0	292.9	81.6	190.4	53.0	102.5	28.5	81.6
Cat A-666	Off-Site to SE Corner - Via Creek	250.1	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	214.5	292.9	141.3	0	0	292.9	73.3	190.4	47.6	102.5	25.6	73.3
Cat A-667	Off-Site to SE Corner - Via Creek	239.4	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	205.4	292.9	135.2	0	0	292.9	70.1	190.4	45.6	102.5	24.5	70.1
Cat A-668	Off-Site to SE Corner - Via Creek	2.8	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	2.4	292.9	1.6	0	0	292.9	0.8	190.4	0.5	102.5	0.3	0.8
Cat A-669	Off-Site to SE Corner - Via Creek	6.5	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	5.6	292.9	3.7	0	0	292.9	1.9	190.4	1.2	102.5	0.7	1.9
Cat A-670	Off-Site to SE Corner - Via Creek	33.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	28.5	292.9	18.7	0	0	292.9	9.7	190.4	6.3	102.5	3.4	9.7
Cat A-671	Off-Site to SE Corner - Via Creek	43.1	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	36.9	292.9	24.3	0	0	292.9	12.6	190.4	8.2	102.5	4.4	12.6
Cat A-672	Off-Site to SE Corner - Via Creek	116.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	99.7	292.9	65.6	0	0	292.9	34.0	190.4	22.1	102.5	11.9	34.0
Cat A-673	Off-Site to SE Corner - Via Creek	12.4	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	10.6	292.9	7.0	0	0	292.9	3.6	190.4	2.4	102.5	1.3	3.6
Cat A-674	Off-Site to SE Corner - Via Creek	20.0	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	17.1	292.9	11.3	0	0	292.9	5.9	190.4	3.8	102.5	2.0	5.9
Cat A-675	Off-Site to SE Corner - Via Creek	48.3	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	41.4	292.9	27.3	0	0	292.9	14.1	190.4	9.2	102.5	5.0	14.1
Cat A-676	Off-Site to SE Corner - Via Creek	59.0	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	50.6	292.9	33.3	0	0	292.9	17.3	190.4	11.2	102.5	6.0	17.3
Cat A-677	Off-Site to SE Corner - Via Creek	147.7	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	126.6	292.9	83.4	0	0	292.9	43.3	190.4	28.1	102.5	15.1	43.3
Cat A-678	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	9.3	292.9	6.1	0	0	292.9	3.2	190.4	2.1	102.5	1.1	3.2
Cat A-679	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	9.3	292.9	6.1	0	0	292.9	3.2	190.4	2.1	102.5	1.1	3.2
Cat A-680	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	9.3	292.9	6.2	0	0	292.9	3.2	190.4	2.1	102.5	1.1	3.2
Cat A-681	Off-Site to SE Corner - Via Creek	8.1	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	6.9	292.9	4.6	0	0	292.9	2.4	190.4	1.5	102.5	0.8	2.4
Cat A-682	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	9.3	292.9	6.2	0	0	292.9	3.2	190.4	2.1	102.5	1.1	3.2
Cat A-683	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	9.3	292.9	6.2	0	0	292.9	3.2	190.4	2.1	102.5	1.1	3.2
Cat A-684	Off-Site to SE Corner - Via Creek	10.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	9.3	292.9	6.2	0	0	292.9	3.2	190.4	2.1	102.5	1.1	3.2
Cat A-685	Off-Site to SE Corner - Via Creek	46.5	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	39.8	292.9	26.2	0	0	292.9	13.6	190.4	8.8	102.5	4.8	13.6
Cat A-686	Off-Site to SE Corner - Via Creek	50.7	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	43.4	292.9	28.6	0	0	292.9	14.8	190.4	9.6	102.5	5.2	14.8
Cat A-687	Off-Site to SE Corner - Via Creek	4.5	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	3.9	292.9	2.5	0	0	292.9	1.3	190.4	0.9	102.5	0.5	1.3
Cat A-688	Off-Site to SE Corner - Via Creek	34.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	29.9	292.9	19.7	0	0	292.9	10.2	190.4	6.6	102.5	3.6	10.2
Cat A-689	Off-Site to SE Corner - Via Creek	53.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	45.6	292.9	30.0	0	0	292.9	15.6	190.4	10.1	102.5	5.4	15.6
Cat A-690	Off-Site to SE Corner - Via Creek	48.5	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	41.6	292.9	27.4	0	0	292.9	14.2	190.4	9.2	102.5	5.0	14.2
Cat A-691	Off-Site to SE Corner - Via Creek	45.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	39.4	292.9	25.9	0	0	292.9	13.4	190.4	8.7	102.5	4.7	13.4
Cat A-692	Off-Site to SE Corner - Via Creek	44.0	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	37.8	292.9	24.9	0	0	292.9	12.9	190.4	8.4	102.5	4.5	12.9
Cat A-693	Off-Site to SE Corner - Via Creek	44.4	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	38.1	292.9	25.1	0	0	292.9	13.0	190.4	8.4	102.5	4.5	13.0
Cat A-694	Off-Site to SE Corner - Via Creek	954.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	818.4	292.9	538.9	0	0	292.9	279.5	190.4	181.7	102.5	97.8	279.5
Cat A-695	Off-Site to SE Corner - Via Creek	1826.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	1566.3	292.9	1031.4	0	0	292.9	534.9	190.4	347.7	102.5	187.2	534.9
Cat A-696	Off-Site to SE Corner - Via Creek	102.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	88.3	289.9	58.4	0	0	289.9	29.8	202.9	20.9	87.0	9.0	29.8
Cat A-697	Off-Site to SE Corner - Via Creek	225.7	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	193.6	289.9	128.1	0	0	289.9	65.4	202.9	45.8	87.0	19.6	65.4
Cat A-698	Off-Site to SE Corner - Via Creek	121.1	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	103.9	289.9	68.8	0	0	289.9	35.1	202.9	24.6	87.0	10.5	35.1
Cat A-699	Off-Site to SE Corner - Via Creek	84.7	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	72.7	289.9	48.1	0	0	289.9	24.6	202.9	17.2	87.0	7.4	24.6
Cat A-700	Off-Site to SE Corner - Via Creek	192.6	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	165.2	289.9	109.4	0	0	289.9	55.9	202.9	39.1	87.0	16.8	55.9
Cat A-701	Off-Site to SE Corner - Via Creek	186.4	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	159.9	289.9	105.9	0	0	289.9	54.1	202.9	37.8	87.0	16.2	54.1
Cat A-702	Off-Site to SE Corner - Via Creek	113.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	97.7	289.9	64.7	0	0	289.9	33.0	202.9	23.1	87.0	9.9	33.0
Cat A-703	Off-Site to SE Corner - Via Creek	110.7	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	95.0	289.9	62.9	0	0	289.9	32.1	202.9	22.5	87.0	9.6	32.1
Cat A-704	Off-Site to SE Corner - Via Creek	74.0	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	63.5	289.9	42.0	0	0	289.9	21.4	202.9	15.0	87.0	6.4	21.4
Cat A-705	Off-Site to SE Corner - Via Creek	66.5	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	57.0	289.9	37.8	0	0	289.9	19.3	202.9	13.5	87.0	5.8	19.3
Cat A-706	Off-Site to SE Corner - Via Creek	224.1	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	192.2	289.9	127.3	0	0	289.9	65.0	202.9	45.5	87.0	19.5	65.0
Cat A-707	Off-Site to SE Corner - Via Creek	274.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	235.8	289.9	156.1	0	0	289.9	79.7	202.9	55.8	87.0	23.9	79.7
Cat A-708	Off-Site to SE Corner - Via Creek	46.2	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	39.6	289.9	26.2	0	0	289.9	13.4	202.9	9.4	87.0	4.0	13.4
Cat A-709	Off-Site to SE Corner - Via Creek	112.0	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	96.0	289.9	63.6	0	0	289.9	32.5	202.9	22.7	87.0	9.7	32.5
Cat A-710	Off-Site to SE Corner - Via Creek	3.7	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	3.1	289.9	2.1	0	0	289.9	1.1	202.9	0.7	87.0	0.3	1.1
Cat A-711	Off-Site to SE Corner - Via Creek	9.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	8.5	289.9	5.6	0	0	289.9	2.9	202.9	2.0	87.0	0.9	2.9
Cat A-712	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	9.3	289.9	6.2	0	0	289.9	3.1	202.9	2.2	87.0	0.9	3.1
Cat A-713	Off-Site to SE Corner - Via Creek	10.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	9.3	289.9	6.2	0	0	289.9	3.2	202.9	2.2	87.0	0.9	3.2
Cat A-714	Off-Site to SE Corner - Via Creek	52.8	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	45.3	289.9	30.0	0	0	289.9	15.3	202.9	10.7	87.0	4.6	15.3
Cat A-715	Off-Site to SE Corner - Via Creek	11.4	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	9.8	289.9	6.5	0	0	289.9	3.3	202.9	2.3	87.0	1.0	3.3

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-716	Off-Site to SE Corner - Via Creek	5.1	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	4.4	289.9	2.9	0	0	289.9	1.5	202.9	1.0	87.0	0.4	1.5
Cat A-717	Off-Site to SE Corner - Via Creek	39.5	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	33.9	289.9	22.4	0	0	289.9	11.4	202.9	8.0	87.0	3.4	11.4
Cat A-718	Off-Site to SE Corner - Via Creek	11.6	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	10.0	289.9	6.6	0	0	289.9	3.4	202.9	2.4	87.0	1.0	3.4
Cat A-719	Off-Site to SE Corner - Via Creek	4.1	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	3.5	289.9	2.3	0	0	289.9	1.2	202.9	0.8	87.0	0.4	1.2
Cat A-722	Off-Site to SE Corner - Via Creek	29805.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	25564.3	292.9	16833.8	17.5	521	310.4	9251.7	232.8	6938.8	77.6	2312.9	9251.7
Cat A-723	Off-Site to SE Corner - Via Creek	25.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	21.9	292.9	14.4	0	0	292.9	7.5	219.7	5.6	73.2	1.9	7.5
Cat A-724	Off-Site to SE Corner - Via Creek	34.5	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	29.6	292.9	19.5	0	0	292.9	10.1	190.4	6.6	102.5	3.5	10.1
Cat A-725	Off-Site to SE Corner - Via Creek	194.6	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	166.9	292.9	109.9	0	0	292.9	57.0	190.4	37.0	102.5	19.9	57.0
Cat A-726	Off-Site to SE Corner - Via Creek	309.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	265.6	292.9	174.9	0	0	292.9	90.7	219.7	68.0	73.2	22.7	90.7
Cat A-729	Off-Site to SE Corner - Via Creek	49.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	42.4	301.9	27.4	0	0	301.9	14.9	211.3	10.4	90.6	4.5	14.9
Cat A-730	Off-Site to SE Corner - Via Creek	37.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	32.1	301.9	20.8	0	0	301.9	11.3	211.3	7.9	90.6	3.4	11.3
Cat A-731	Off-Site to SE Corner - Via Creek	57.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	49.5	301.9	32.1	0	0	301.9	17.4	211.3	12.2	90.6	5.2	17.4
Cat A-732	Off-Site to SE Corner - Via Creek	250.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	214.9	301.9	139.2	0	0	301.9	75.6	211.3	52.9	90.6	22.7	75.6
Cat A-733	Off-Site to SE Corner - Via Creek	95.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	81.6	301.9	52.9	0	0	301.9	28.7	211.3	20.1	90.6	8.6	28.7
Cat A-734	Off-Site to SE Corner - Via Creek	74.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	63.8	301.9	41.3	0	0	301.9	22.4	211.3	15.7	90.6	6.7	22.4
Cat A-735	Off-Site to SE Corner - Via Creek	64.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	55.6	301.9	36.0	0	0	301.9	19.6	211.3	13.7	90.6	5.9	19.6
Cat A-736	Off-Site to SE Corner - Via Creek	8.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	6.9	301.9	4.5	0	0	301.9	2.4	211.3	1.7	90.6	0.7	2.4
Cat A-737	Off-Site to SE Corner - Via Creek	49.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	42.1	301.9	27.3	0	0	301.9	14.8	211.3	10.4	90.6	4.4	14.8
Cat A-738	Off-Site to SE Corner - Via Creek	159.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	137.1	301.9	88.8	0	0	301.9	48.3	211.3	33.8	90.6	14.5	48.3
Cat A-739	Off-Site to SE Corner - Via Creek	39.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	33.5	301.9	21.7	0	0	301.9	11.8	211.3	8.3	90.6	3.5	11.8
Cat A-740	Off-Site to SE Corner - Via Creek	27.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	23.6	301.9	15.3	0	0	301.9	8.3	211.3	5.8	90.6	2.5	8.3
Cat A-741	Off-Site to SE Corner - Via Creek	17.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	14.7	301.9	9.5	0	0	301.9	5.2	211.3	3.6	90.6	1.6	5.2
Cat A-742	Off-Site to SE Corner - Via Creek	17.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	15.0	301.9	9.7	0	0	301.9	5.3	211.3	3.7	90.6	1.6	5.3
Cat A-743	Off-Site to SE Corner - Via Creek	5.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.4	301.9	2.9	0	0	301.9	1.6	211.3	1.1	90.6	0.5	1.6
Cat A-744	Off-Site to SE Corner - Via Creek	537.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	460.7	301.9	298.6	0	0	301.9	162.2	211.3	113.5	90.6	48.7	162.2
Cat A-745	Off-Site to SE Corner - Via Creek	5.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.8	301.9	3.1	0	0	301.9	1.7	211.3	1.2	90.6	0.5	1.7
Cat A-755	Off-Site to SE Corner - Via Creek	1059.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	908.6	289.9	601.5	225.4	239	515.3	545.9	412.3	436.7	103.1	109.2	545.9
Cat A-756	Off-Site to SE Corner - Via Creek	31.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	27.3	289.9	18.1	0	0	289.9	9.2	231.9	7.4	58.0	1.8	9.2
Cat A-757	Off-Site to SE Corner - Via Creek	52.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	45.1	289.9	29.9	0	0	289.9	15.3	231.9	12.2	58.0	3.1	15.3
Cat A-758	Off-Site to SE Corner - Via Creek	66.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	57.3	289.9	37.9	0	0	289.9	19.4	231.9	15.5	58.0	3.9	19.4
Cat A-759	Off-Site to SE Corner - Via Creek	48.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	41.5	289.9	27.5	0	0	289.9	14.0	231.9	11.2	58.0	2.8	14.0
Cat A-760	Off-Site to SE Corner - Via Creek	57.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	49.7	289.9	32.9	0	0	289.9	16.8	231.9	13.4	58.0	3.4	16.8
Cat A-761	Off-Site to SE Corner - Via Creek	72.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	62.2	289.9	41.2	0	0	289.9	21.0	231.9	16.8	58.0	4.2	21.0
Cat A-762	Off-Site to SE Corner - Via Creek	59.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	51.0	289.9	33.8	0	0	289.9	17.2	231.9	13.8	58.0	3.4	17.2
Cat A-763	Off-Site to SE Corner - Via Creek	70.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	60.2	289.9	39.9	0	0	289.9	20.4	231.9	16.3	58.0	4.1	20.4
Cat A-764	Off-Site to SE Corner - Via Creek	67.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	58.2	289.9	38.5	0	0	289.9	19.7	231.9	15.7	58.0	3.9	19.7
Cat A-765	Off-Site to SE Corner - Via Creek	63.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	54.6	289.9	36.1	0	0	289.9	18.5	231.9	14.8	58.0	3.7	18.5
Cat A-766	Off-Site to SE Corner - Via Creek	60.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	51.7	289.9	34.2	0	0	289.9	17.5	231.9	14.0	58.0	3.5	17.5
Cat A-767	Off-Site to SE Corner - Via Creek	55.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	47.9	289.9	31.7	0	0	289.9	16.2	231.9	12.9	58.0	3.2	16.2
Cat A-768	Off-Site to SE Corner - Via Creek	61.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	52.4	289.9	34.7	0	0	289.9	17.7	231.9	14.2	58.0	3.5	17.7
Cat A-769	Off-Site to SE Corner - Via Creek	56.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	48.4	289.9	32.0	0	0	289.9	16.4	231.9	13.1	58.0	3.3	16.4
Cat A-770	Off-Site to SE Corner - Via Creek	52.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	44.6	289.9	29.5	0	0	289.9	15.1	231.9	12.1	58.0	3.0	15.1
Cat A-771	Off-Site to SE Corner - Via Creek	49.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	42.1	289.9	27.8	0	0	289.9	14.2	231.9	11.4	58.0	2.8	14.2
Cat A-772	Off-Site to SE Corner - Via Creek	25.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	22.3	289.9	14.7	0	0	289.9	7.5	231.9	6.0	58.0	1.5	7.5
Cat A-773	Off-Site to SE Corner - Via Creek	162.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	139.3	289.9	92.2	0	0	289.9	47.1	231.9	37.7	58.0	9.4	47.1
Cat A-774	Off-Site to SE Corner - Via Creek	1658.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	1422.8	289.9	941.9	0	0	289.9	480.9	231.9	384.7	58.0	96.2	480.9
Cat A-775	Off-Site to SE Corner - Via Creek	49.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	42.3	289.9	28.0	0	0	289.9	14.3	231.9	11.4	58.0	2.9	14.3
Cat A-776	Off-Site to SE Corner - Via Creek	48.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	41.4	289.9	27.4	0	0	289.9	14.0	231.9	11.2	58.0	2.8	14.0
Cat A-777	Off-Site to SE Corner - Via Creek	66.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	56.8	289.9	37.6	0	0	289.9	19.2	231.9	15.4	58.0	3.8	19.2
Cat A-778	Off-Site to SE Corner - Via Creek	14.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	12.5	289.9	8.3	0	0	289.9	4.2	231.9	3.4	58.0	0.8	4.2
Cat A-779	Off-Site to SE Corner - Via Creek	690.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	592.2	289.9	392.0	0	0	289.9	200.2	231.9	160.1	58.0	40.0	200.2
Cat A-780	Off-Site to SE Corner - Via Creek	100.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	86.6	289.9	57.3	0	0	289.9	29.3	231.9	23.4	58.0	5.9	29.3
Cat A-781	Off-Site to SE Corner - Via Creek	66.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	56.6	289.9	37.5	0	0	289.9	19.1	231.9	15.3	58.0	3.8	19.1
Cat A-782	Off-Site to SE Corner - Via Creek	20.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	17.5	289.9	11.6	0	0	289.9	5.9	231.9	4.7	58.0	1.2	5.9
Cat A-783	Off-Site to SE Corner - Via Creek	54.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	47.0	289.9	31.1	0	0	289.9	15.9	231.9	12.7	58.0	3.2	15.9
Cat A-784	Off-Site to SE Corner - Via Creek	60.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	51.7	289.9	34.3	0	0	289.9	17.5	231.9	14.0	58.0	3.5	17.5
Cat A-785	Off-Site to SE Corner - Via Creek	9.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	8.4	289.9	5.5	0	0	289.9	2.8	231.9	2.3	58.0	0.6	2.8
Cat A-786	Off-Site to SE Corner - Via Creek	56.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	48.2	289.9	31.9	0	0	289.9	16.3	231.9	13.0	58.0	3.3	16.3
Cat A-787	Off-Site to SE Corner - Via Creek	83.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	71.9	289.9	47.6	0	0	289.9	24.3	231.9	19.4	58.0	4.9	24.3
Cat A-788	Off-Site to SE Corner - Via Creek	374.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	320.9	289.9	212.4	0	0	289.9	108.5	231.9	86.8	58.0	21.7	108.5
Cat A-789	Off-Site to SE Corner - Via Creek	15.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	13.4	289.9	8.9	0	0	289.9	4.5	231.9	3.6	58.0	0.9	4.5
Cat A-790	Off-Site to SE Corner - Via Creek	785.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	673.4	289.9	445.8	0	0	289.9	227.6	231.9	182.1	58.0	45.5	227.6
Cat A-791	Off-Site to SE Corner - Via Creek	600.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	514.7	289.9	340.8	0	0	289.9	174.0	231.9	139.2	58.0	34.8	174.0
Cat A-792	Off-Site to SE Corner - Via Creek	530.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	454.8	289.9	301.1	0	0	289.9	153.7	231.9	123.0	58.0	30.7	153.7
Cat A-793	Off-Site to SE Corner - Via Creek	234.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	200.9	289.9	133.0	0	0	289.9	67.9	231.9	54.3	58.0	13.6	67.9
Cat A-794	Off-Site to SE Corner - Via Creek	19.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	16.3	289.9	10.8	0	0	289.9	5.5	231.9	4.4	58.0	1.1	5.5
Cat A-795	Off-Site to SE Corner - Via Creek	3.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	3.1	289.9	2.1	0	0	289.9	1.1	231.9	0.8	58.0	0.2	1.1
Cat A-796	Off-Site to SE Corner - Via Creek	611.5	Gravel	0.05	Silt Loam	0.4	0.15	0.6	0.6	857.7	524.5	301.9	339.9	0	0	301.9	184.6	181.1	110.8	120.8	73.9	184.6
Cat A-811	Off-Site to SE Corner - Via Creek	406.5	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	348.7	283.9	233.3	0	0	283.9	115.4	241.3	98.1	42.6	17.3	115.4
Cat A-812	Off-Site to SE Corner - Via Creek	5.9	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	5.0	283.9	3.4	0	0	283.9	1.7	241.3	1.4	42.6	0.3	1.7
Cat A-813	Off-Site to SE Corner - Via Creek	69.0	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	59.2	283.9	39.6	0	0	283.9	19.6	241.3	16.7	42.6	2.9	19.6
Cat A-814	Off-Site to SE Corner - Via Creek	92.9	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	79.7	283.9	53.3	0	0	283.9	26.4	241.3	22.4	42.6	4.0	26.4
Cat A-815	Off-Site to SE Corner - Via Creek	34.8	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	29.9	283.9	20.0	0	0	283.9	9.9	241.3	8.4	42.6	1.5	9.9
Cat A-816	Off-Site to SE Corner - Via Creek	59.2	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	50.7	283.9	33.9	0	0	283.9	16.8	241.3	14.3	42.6	2.5	16.8
Cat A-817	Off-Site to SE Corner - Via Creek	641.8	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	550.5	283.9	368.3	0	0	283.9	182.2	241.3	154.9	42.6	27.3	182.2
Cat A-818	Off-Site to SE Corner - Via Creek	13743.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	11787.7	283.9	7885.7	0	0	283.9	3902.0	241.3	3316.7	42.6	585.3	3902.0
Cat A-819	Off-Site to SE Corner - Via Creek	103.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	88.6	283.9	59.2	0	0	283.9	29.3	241.3	24.9	42.6	4.4	29.3
Cat A-820	Off-Site to SE Corner - Via Creek	26.4	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	22.6	283.9	15.1	0	0	283.9	7.5	241.3	6.4	42.6	1.1	7.5
Cat A-821	Off-Site to SE Corner - Via Creek	266.3	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	228.4	283.9	152.8	0	0	283.9	75.6	241.3	64.3	42.6	11.3	75.6
Cat A-822	Off-Site to SE Corner - Via Creek	197.0	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	169.0	283.9	113.0	0	0	283.9	55.9	241.3	47.5	42.6	8.4	55.9
Cat A-823	Off-Site to SE Corner - Via Creek	94.8	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	81.3	283.9	54.4	0	0	283.9	26.9	241.3	22.9	42.6	4.0	26.9

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-824	Off-Site to SE Corner - Via Creek	42.1	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	36.1	283.9	24.1	0	0	283.9	11.9	241.3	10.2	42.6	1.8	11.9
Cat A-825	Off-Site to SE Corner - Via Creek	56.7	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	48.6	283.9	32.5	0	0	283.9	16.1	241.3	13.7	42.6	2.4	16.1
Cat A-826	Off-Site to SE Corner - Via Creek	5.8	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	4.9	283.9	3.3	0	0	283.9	1.6	241.3	1.4	42.6	0.2	1.6
Cat A-827	Off-Site to SE Corner - Via Creek	202.8	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	174.0	283.9	116.4	0	0	283.9	57.6	241.3	49.0	42.6	8.6	57.6
Cat A-828	Off-Site to SE Corner - Via Creek	36.4	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	31.3	283.9	20.9	0	0	283.9	10.3	241.3	8.8	42.6	1.6	10.3
Cat A-829	Off-Site to SE Corner - Via Creek	5739.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4922.4	301.9	3189.7	0	0	301.9	1732.7	211.3	1212.9	90.6	519.8	1732.7
Cat A-830	Off-Site to SE Corner - Via Creek	82.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	70.3	292.9	46.3	0	0	292.9	24.0	219.7	18.0	73.2	6.0	24.0
Cat A-831	Off-Site to SE Corner - Via Creek	3.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	3.1	292.9	2.0	0	0	292.9	1.0	219.7	0.8	73.2	0.3	1.0
Cat A-832	Off-Site to SE Corner - Via Creek	107.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	92.3	292.9	60.8	0	0	292.9	31.5	219.7	23.6	73.2	7.9	31.5
Cat A-833	Off-Site to SE Corner - Via Creek	47.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.4	292.9	26.6	0	0	292.9	13.8	219.7	10.4	73.2	3.5	13.8
Cat A-834	Off-Site to SE Corner - Via Creek	30.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	26.5	292.9	17.4	0	0	292.9	9.0	219.7	6.8	73.2	2.3	9.0
Cat A-835	Off-Site to SE Corner - Via Creek	32.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	28.2	292.9	18.6	0	0	292.9	9.6	219.7	7.2	73.2	2.4	9.6
Cat A-836	Off-Site to SE Corner - Via Creek	1582.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1357.2	292.9	893.7	0	0	292.9	463.5	219.7	347.6	73.2	115.9	463.5
Cat A-837	Off-Site to SE Corner - Via Creek	40.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	34.6	292.9	22.8	0	0	292.9	11.8	219.7	8.9	73.2	3.0	11.8
Cat A-838	Off-Site to SE Corner - Via Creek	48.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	41.8	292.9	27.5	0	0	292.9	14.3	219.7	10.7	73.2	3.6	14.3
Cat A-839	Off-Site to SE Corner - Via Creek	57.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	49.4	292.9	32.5	0	0	292.9	16.9	219.7	12.7	73.2	4.2	16.9
Cat A-840	Off-Site to SE Corner - Via Creek	62.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	53.4	292.9	35.1	0	0	292.9	18.2	219.7	13.7	73.2	4.6	18.2
Cat A-841	Off-Site to SE Corner - Via Creek	42.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	36.7	292.9	24.2	0	0	292.9	12.5	219.7	9.4	73.2	3.1	12.5
Cat A-842	Off-Site to SE Corner - Via Creek	38.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	33.3	292.9	21.9	0	0	292.9	11.4	219.7	8.5	73.2	2.8	11.4
Cat A-843	Off-Site to SE Corner - Via Creek	8.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	7.2	292.9	4.8	0	0	292.9	2.5	219.7	1.9	73.2	0.6	2.5
Cat A-844	Off-Site to SE Corner - Via Creek	33.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	28.8	292.9	19.0	0	0	292.9	9.8	219.7	7.4	73.2	2.5	9.8
Cat A-845	Off-Site to SE Corner - Via Creek	36.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	30.9	292.9	20.4	0	0	292.9	10.6	219.7	7.9	73.2	2.6	10.6
Cat A-846	Off-Site to SE Corner - Via Creek	47.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	40.4	292.9	26.6	0	0	292.9	13.8	219.7	10.4	73.2	3.5	13.8
Cat A-847	Off-Site to SE Corner - Via Creek	67.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	58.1	292.9	38.3	0	0	292.9	19.8	219.7	14.9	73.2	5.0	19.8
Cat A-848	Off-Site to SE Corner - Via Creek	64.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	54.9	292.9	36.2	0	0	292.9	18.8	219.7	14.1	73.2	4.7	18.8
Cat A-849	Off-Site to SE Corner - Via Creek	50.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.3	292.9	28.5	0	0	292.9	14.8	219.7	11.1	73.2	3.7	14.8
Cat A-850	Off-Site to SE Corner - Via Creek	62.4	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	53.5	292.9	35.2	0	0	292.9	18.3	219.7	13.7	73.2	4.6	18.3
Cat A-851	Off-Site to SE Corner - Via Creek	53.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.6	292.9	30.0	0	0	292.9	15.6	219.7	11.7	73.2	3.9	15.6
Cat A-852	Off-Site to SE Corner - Via Creek	64.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	55.0	292.9	36.2	0	0	292.9	18.8	219.7	14.1	73.2	4.7	18.8
Cat A-853	Off-Site to SE Corner - Via Creek	51.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	44.5	292.9	29.3	0	0	292.9	15.2	219.7	11.4	73.2	3.8	15.2
Cat A-854	Off-Site to SE Corner - Via Creek	67.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	57.9	292.9	38.2	0	0	292.9	19.8	219.7	14.8	73.2	4.9	19.8
Cat A-855	Off-Site to SE Corner - Via Creek	54.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.3	292.9	30.5	0	0	292.9	15.8	219.7	11.9	73.2	4.0	15.8
Cat A-856	Off-Site to SE Corner - Via Creek	68.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	58.3	292.9	38.4	0	0	292.9	19.9	219.7	14.9	73.2	5.0	19.9
Cat A-857	Off-Site to SE Corner - Via Creek	57.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	49.1	292.9	32.3	0	0	292.9	16.8	219.7	12.6	73.2	4.2	16.8
Cat A-858	Off-Site to SE Corner - Via Creek	2479.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	2126.3	292.9	1400.1	0	0	292.9	726.2	219.7	544.6	73.2	181.5	726.2
Cat A-859	Off-Site to SE Corner - Via Creek	65.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	56.4	292.9	37.1	0	0	292.9	19.3	219.7	14.4	73.2	4.8	19.3
Cat A-860	Off-Site to SE Corner - Via Creek	65.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	55.8	292.9	36.7	0	0	292.9	19.0	219.7	14.3	73.2	4.8	19.0
Cat A-861	Off-Site to SE Corner - Via Creek	11.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	9.5	292.9	6.2	0	0	292.9	3.2	219.7	2.4	73.2	0.8	3.2
Cat A-862	Off-Site to SE Corner - Via Creek	51.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.9	292.9	28.9	0	0	292.9	15.0	219.7	11.2	73.2	3.7	15.0
Cat A-863	Off-Site to SE Corner - Via Creek	61.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	52.7	292.9	34.7	0	0	292.9	18.0	219.7	13.5	73.2	4.5	18.0
Cat A-864	Off-Site to SE Corner - Via Creek	53.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.6	292.9	30.0	0	0	292.9	15.6	219.7	11.7	73.2	3.9	15.6
Cat A-865	Off-Site to SE Corner - Via Creek	66.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	56.7	292.9	37.3	0	0	292.9	19.4	219.7	14.5	73.2	4.8	19.4
Cat A-866	Off-Site to SE Corner - Via Creek	46.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	39.7	292.9	26.2	0	0	292.9	13.6	219.7	10.2	73.2	3.4	13.6
Cat A-867	Off-Site to SE Corner - Via Creek	69.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	59.2	292.9	39.0	0	0	292.9	20.2	219.7	15.2	73.2	5.1	20.2
Cat A-868	Off-Site to SE Corner - Via Creek	55.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	47.4	292.9	31.2	0	0	292.9	16.2	219.7	12.1	73.2	4.0	16.2
Cat A-869	Off-Site to SE Corner - Via Creek	58.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	50.2	292.9	33.0	0	0	292.9	17.1	219.7	12.9	73.2	4.3	17.1
Cat A-870	Off-Site to SE Corner - Via Creek	50.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.6	292.9	28.7	0	0	292.9	14.9	219.7	11.2	73.2	3.7	14.9
Cat A-871	Off-Site to SE Corner - Via Creek	65.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	55.7	292.9	36.7	0	0	292.9	19.0	219.7	14.3	73.2	4.8	19.0
Cat A-872	Off-Site to SE Corner - Via Creek	53.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	46.1	292.9	30.4	0	0	292.9	15.8	219.7	11.8	73.2	3.9	15.8
Cat A-873	Off-Site to SE Corner - Via Creek	69.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	59.7	292.9	39.3	0	0	292.9	20.4	219.7	15.3	73.2	5.1	20.4
Cat A-874	Off-Site to SE Corner - Via Creek	125.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	107.5	292.9	70.8	0	0	292.9	36.7	219.7	27.5	73.2	9.2	36.7
Cat A-875	Off-Site to SE Corner - Via Creek	72.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	61.8	292.9	40.7	0	0	292.9	21.1	219.7	15.8	73.2	5.3	21.1
Cat A-876	Off-Site to SE Corner - Via Creek	406.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	348.3	292.9	229.3	0	0	292.9	118.9	219.7	89.2	73.2	29.7	118.9
Cat A-877	Off-Site to SE Corner - Via Creek	62.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	53.6	292.9	35.3	0	0	292.9	18.3	219.7	13.7	73.2	4.6	18.3
Cat A-878	Off-Site to SE Corner - Via Creek	60.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	51.5	292.9	33.9	0	0	292.9	17.6	219.7	13.2	73.2	4.4	17.6
Cat A-879	Off-Site to SE Corner - Via Creek	66.3	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	56.8	292.9	37.4	0	0	292.9	19.4	219.7	14.6	73.2	4.9	19.4
Cat A-880	Off-Site to SE Corner - Via Creek	70.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	60.1	292.9	39.6	0	0	292.9	20.5	219.7	15.4	73.2	5.1	20.5
Cat A-881	Off-Site to SE Corner - Via Creek	60.7	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	52.1	292.9	34.3	0	0	292.9	17.8	219.7	13.3	73.2	4.4	17.8
Cat A-882	Off-Site to SE Corner - Via Creek	158.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	136.0	292.9	89.6	0	0	292.9	46.4	219.7	34.8	73.2	11.6	46.4
Cat A-883	Off-Site to SE Corner - Via Creek	85.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	72.9	292.9	48.0	0	0	292.9	24.9	219.7	18.7	73.2	6.2	24.9
Cat A-884	Off-Site to SE Corner - Via Creek	67.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	58.2	292.9	38.3	0	0	292.9	19.9	219.7	14.9	73.2	5.0	19.9
Cat A-885	Off-Site to SE Corner - Via Creek	50.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	43.6	292.9	28.7	0	0	292.9	14.9	219.7	11.2	73.2	3.7	14.9
Cat A-886	Off-Site to SE Corner - Via Creek	211.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	181.6	292.9	119.6	0	0	292.9	62.0	219.7	46.5	73.2	15.5	62.0
Cat A-887	Off-Site to SE Corner - Via Creek	52.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	45.4	292.9	29.9	0	0	292.9	15.5	219.7	11.6	73.2	3.9	15.5
Cat A-888	Off-Site to SE Corner - Via Creek	57.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	49.0	292.9	32.3	0	0	292.9	16.7	219.7	12.6	73.2	4.2	16.7
Cat A-889	Off-Site to SE Corner - Via Creek	41.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	35.6	292.9	23.4	0	0	292.9	12.1	219.7	9.1	73.2	3.0	12.1
Cat A-890	Off-Site to SE Corner - Via Creek	9.1	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	7.8	292.9	5.2	0	0	292.9	2.7	219.7	2.0	73.2	0.7	2.7
Cat A-891	Off-Site to SE Corner - Via Creek	1.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1.3	292.9	0.8	0	0	292.9	0.4	219.7	0.3	73.2	0.1	0.4
Cat A-892	Off-Site to SE Corner - Via Creek	1.5	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1.3	292.9	0.9	0	0	292.9	0.5	219.7	0.3	73.2	0.1	0.5
Cat A-893	Off-Site to SE Corner - Via Creek	161.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	138.8	292.9	91.4	0	0	292.9	47.4	219.7	35.5	73.2	11.8	47.4
Cat A-894	Off-Site to SE Corner - Via Creek	1699.2	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	1457.4	292.9	959.7	0	0	292.9	497.7	219.7	373.3	73.2	124.4	497.7
Cat A-895	Off-Site to SE Corner - Via Creek	3797.4	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	3257.0	283.9	2178.9	0	0	283.9	1078.1	241.3	916.4	42.6	161.7	1078.1
Cat A-896	Off-Site to SE Corner - Via Creek	5712.0	Lawns	0.05	Silt Loam	0.4	0.15	0.6	0.6	857.7	4899.2	301.9	3174.7	0	0	301.9	1724.6	181.1	1034.7	120.8	689.8	1724.6
Cat A-897	Off-Site to SE Corner - Via Creek	22.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	19.1	289.9	12.7	0	0	289.9	6.5	231.9	5.2	58.0	1.3	6.5
Cat A-898	Off-Site to SE Corner - Via Creek	34.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	29.5	289.9	19.5	0	0	289.9	10.0	231.9	8.0	58.0	2.0	10.0
Cat A-899	Off-Site to SE Corner - Via Creek	50.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	43.5	289.9	28.8	0	0	289.9	14.7	231.9	11.8	58.0	2.9	14.7
Cat A-900	Off-Site to SE Corner - Via Creek	20.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	17.4	289.9	11.5	0	0	289.9	5.9	231.9	4.7	58.0	1.2	5.9
Cat A-901	Off-Site to SE Corner - Via Creek	69.6	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	59.7	283.9	40.0	0	0	283.9	19.8	212.9	14.8	71.0	4.9	19.8
Cat A-902	Off-Site to SE Corner - Via Creek	98.9	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	84.9	283.9	56.8	0	0	283.9	28.1	212.9	21.1	71.0	7.0	28.1
Cat A-903	Off-Site to SE Corner - Via Creek	70.5	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	60.4	283.9	40.4	0	0	283.9	20.0	212.9	15.0	71.0	5.0	20.0
Cat A-904	Off-Site to SE Corner - Via Creek	69.1	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	59.2	283.9	39.6	0	0	283.9	19.6	212.9	14.7	71.0	4.9	19.6

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat A-905	Off-Site to SE Corner - Via Creek	35.2	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	30.2	283.9	20.2	0	0	283.9	10.0	212.9	7.5	71.0	2.5	10.0
Cat A-906	Off-Site to SE Corner - Via Creek	11.5	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	9.9	283.9	6.6	0	0	283.9	3.3	212.9	2.5	71.0	0.8	3.3
Cat A-907	Off-Site to SE Corner - Via Creek	15.8	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	13.5	283.9	9.0	0	0	283.9	4.5	212.9	3.4	71.0	1.1	4.5
Cat A-908	Off-Site to SE Corner - Via Creek	101.7	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	87.2	283.9	58.3	0	0	283.9	28.9	212.9	21.7	71.0	7.2	28.9
Cat A-909	Off-Site to SE Corner - Via Creek	47.4	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	40.6	283.9	27.2	0	0	283.9	13.4	212.9	10.1	71.0	3.4	13.4
Cat A-910	Off-Site to SE Corner - Via Creek	29.3	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	857.7	25.1	283.9	16.8	0	0	283.9	8.3	212.9	6.2	71.0	2.1	8.3
Cat A-911	Off-Site to SE Corner - Via Creek	20.8	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	17.9	292.9	11.8	0	0	292.9	6.1	190.4	4.0	102.5	2.1	6.1
Cat A-912	Off-Site to SE Corner - Via Creek	587.3	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	503.8	292.9	331.7	0	0	292.9	172.0	190.4	111.8	102.5	60.2	172.0
Cat A-913	Off-Site to SE Corner - Via Creek	8.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	7.0	292.9	4.6	0	0	292.9	2.4	190.4	1.6	102.5	0.8	2.4
Cat A-914	Off-Site to SE Corner - Via Creek	74.8	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	64.2	292.9	42.2	0	0	292.9	21.9	190.4	14.2	102.5	7.7	21.9
Cat A-915	Off-Site to SE Corner - Via Creek	75.1	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	64.5	292.9	42.4	0	0	292.9	22.0	190.4	14.3	102.5	7.7	22.0
Cat A-916	Off-Site to SE Corner - Via Creek	107.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	91.9	292.9	60.5	0	0	292.9	31.4	190.4	20.4	102.5	11.0	31.4
Cat A-917	Off-Site to SE Corner - Via Creek	48.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	41.9	292.9	27.6	0	0	292.9	14.3	190.4	9.3	102.5	5.0	14.3
Cat A-918	Off-Site to SE Corner - Via Creek	60.8	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	52.2	292.9	34.3	0	0	292.9	17.8	190.4	11.6	102.5	6.2	17.8
Cat A-919	Off-Site to SE Corner - Via Creek	10.6	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	9.1	292.9	6.0	0	0	292.9	3.1	190.4	2.0	102.5	1.1	3.1
Cat A-920	Off-Site to SE Corner - Via Creek	98.9	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	84.8	292.9	55.8	0	0	292.9	29.0	190.4	18.8	102.5	10.1	29.0
Cat A-921	Off-Site to SE Corner - Via Creek	31.1	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	26.7	292.9	17.6	0	0	292.9	9.1	190.4	5.9	102.5	3.2	9.1
Cat A-922	Off-Site to SE Corner - Via Creek	44.2	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	37.9	292.9	25.0	0	0	292.9	13.0	190.4	8.4	102.5	4.5	13.0
Cat A-923	Off-Site to SE Corner - Via Creek	59.3	Cultivated	0.1	Silt Loam	0.4	0.15	0.65	0.65	857.7	50.8	292.9	33.5	0	0	292.9	17.4	190.4	11.3	102.5	6.1	17.4
Cat A-924	Off-Site to SE Corner - Via Creek	401.4	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	344.2	289.9	227.9	0	0	289.9	116.4	202.9	81.5	87.0	34.9	116.4
Cat A-925	Off-Site to SE Corner - Via Creek	58.0	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	49.7	289.9	32.9	0	0	289.9	16.8	202.9	11.8	87.0	5.0	16.8
Cat A-926	Off-Site to SE Corner - Via Creek	159.5	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	136.8	289.9	90.6	0	0	289.9	46.2	202.9	32.4	87.0	13.9	46.2
Cat A-927	Off-Site to SE Corner - Via Creek	6.7	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	5.7	289.9	3.8	0	0	289.9	1.9	202.9	1.4	87.0	0.6	1.9
Cat A-928	Off-Site to SE Corner - Via Creek	707.8	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	607.1	289.9	401.9	0	0	289.9	205.2	202.9	143.6	87.0	61.6	205.2
Cat A-929	Off-Site to SE Corner - Via Creek	9.2	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	7.9	289.9	5.2	0	0	289.9	2.7	202.9	1.9	87.0	0.8	2.7
Cat A-930	Off-Site to SE Corner - Via Creek	11.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	10.2	289.9	6.7	0	0	289.9	3.4	202.9	2.4	87.0	1.0	3.4
Cat A-931	Off-Site to SE Corner - Via Creek	14.5	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	12.4	289.9	8.2	0	0	289.9	4.2	202.9	2.9	87.0	1.3	4.2
Cat A-932	Off-Site to SE Corner - Via Creek	29.4	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	25.2	289.9	16.7	0	0	289.9	8.5	202.9	6.0	87.0	2.6	8.5
Cat A-933	Off-Site to SE Corner - Via Creek	104.9	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	90.0	289.9	59.6	0	0	289.9	30.4	202.9	21.3	87.0	9.1	30.4
Cat A-934	Off-Site to SE Corner - Via Creek	398.1	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	341.5	289.9	226.0	0	0	289.9	115.4	202.9	80.8	87.0	34.6	115.4
Cat A-935	Off-Site to SE Corner - Via Creek	72.2	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	62.0	289.9	41.0	0	0	289.9	20.9	202.9	14.7	87.0	6.3	20.9
Cat A-936	Off-Site to SE Corner - Via Creek	8.4	Uncultivated	0.15	Silt Loam	0.4	0.15	0.7	0.7	857.7	7.2	289.9	4.8	0	0	289.9	2.4	202.9	1.7	87.0	0.7	2.4
Cat A-937	Off-Site to SE Corner - Via Creek	22864.0	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	19610.5	292.9	12913.2	75.4	1,723	368.3	8420.2	276.2	6315.2	92.1	2105.1	8420.2
Cat A-938	Off-Site to SE Corner - Via Creek	11808.6	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	10128.2	292.9	6669.3	0	0	292.9	3458.9	219.7	2594.2	73.2	864.7	3458.9
Pre-Development Catchment A Total		**262,462**								**857.7**	**225,114**	**294.1**	**147,920**	**318**	**2,483**	**303.6**	**79,677**	**227**	**59,594**	**77**	**20,083**	**79,677**
Cat B-3	Offsite SW Corner - Overland Flow	11.0	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	9.4	771.9	0.9	0	0	771.9	8.5	0.0	0.0	771.9	8.5	8.5
Cat B-4	Offsite SW Corner - Overland Flow	61.1	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	52.4	771.9	5.2	0	0	771.9	47.1	0.0	0.0	771.9	47.1	47.1
Cat B-5	Offsite SW Corner - Overland Flow	15.5	Building	0	Silt Loam	0.4	0.25	0.65	0	857.7	13.3	771.9	1.3	0	0	771.9	11.9	0.0	0.0	771.9	11.9	11.9
Cat B-6	Offsite SW Corner - Overland Flow	23.5	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	20.2	301.9	13.1	0	0	301.9	7.1	211.3	5.0	90.6	2.1	7.1
Cat B-7	Offsite SW Corner - Overland Flow	10.0	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	8.6	301.9	5.6	0	0	301.9	3.0	211.3	2.1	90.6	0.9	3.0
Cat B-8	Offsite SW Corner - Overland Flow	22.7	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	19.5	301.9	12.6	0	0	301.9	6.9	211.3	4.8	90.6	2.1	6.9
Cat B-9	Offsite SW Corner - Overland Flow	2.6	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	2.2	301.9	1.4	0	0	301.9	0.8	211.3	0.5	90.6	0.2	0.8
Cat B-10	Offsite SW Corner - Overland Flow	10.9	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.3	301.9	6.0	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat B-11	Offsite SW Corner - Overland Flow	16.9	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	14.5	301.9	9.4	0	0	301.9	5.1	211.3	3.6	90.6	1.5	5.1
Cat B-12	Offsite SW Corner - Overland Flow	21.5	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	18.5	301.9	12.0	0	0	301.9	6.5	211.3	4.5	90.6	1.9	6.5
Cat B-13	Offsite SW Corner - Overland Flow	22.9	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	19.6	301.9	12.7	0	0	301.9	6.9	211.3	4.8	90.6	2.1	6.9
Cat B-14	Offsite SW Corner - Overland Flow	5.6	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.8	301.9	3.1	0	0	301.9	1.7	211.3	1.2	90.6	0.5	1.7
Cat B-15	Offsite SW Corner - Overland Flow	14.5	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	12.4	301.9	8.1	0	0	301.9	4.4	211.3	3.1	90.6	1.3	4.4
Cat B-89	Offsite SW Corner - Overland Flow	323.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	277.1	289.9	183.4	0	0	289.9	93.7	231.9	74.9	58.0	18.7	93.7
Cat B-90	Offsite SW Corner - Overland Flow	97.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	83.2	289.9	55.1	0	0	289.9	28.1	231.9	22.5	58.0	5.6	28.1
Cat B-91	Offsite SW Corner - Overland Flow	38.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	32.9	289.9	21.8	0	0	289.9	11.1	231.9	8.9	58.0	2.2	11.1
Cat B-92	Offsite SW Corner - Overland Flow	6.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	5.2	289.9	3.4	0	0	289.9	1.8	231.9	1.4	58.0	0.4	1.8
Cat B-93	Offsite SW Corner - Overland Flow	66.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	57.3	289.9	37.9	0	0	289.9	19.4	231.9	15.5	58.0	3.9	19.4
Cat B-94	Offsite SW Corner - Overland Flow	129.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	110.9	289.9	73.4	0	0	289.9	37.5	231.9	30.0	58.0	7.5	37.5
Cat B-95	Offsite SW Corner - Overland Flow	225.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	193.3	289.9	127.9	0	0	289.9	65.3	231.9	52.3	58.0	13.1	65.3
Cat B-96	Offsite SW Corner - Overland Flow	89.8	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	77.1	289.9	51.0	0	0	289.9	26.0	231.9	20.8	58.0	5.2	26.0
Cat B-97	Offsite SW Corner - Overland Flow	117.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	100.6	289.9	66.6	0	0	289.9	34.0	231.9	27.2	58.0	6.8	34.0
Cat B-98	Offsite SW Corner - Overland Flow	73.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	62.7	289.9	41.5	0	0	289.9	21.2	231.9	17.0	58.0	4.2	21.2
Cat B-99	Offsite SW Corner - Overland Flow	9.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	8.5	289.9	5.6	0	0	289.9	2.9	231.9	2.3	58.0	0.6	2.9
Cat B-100	Offsite SW Corner - Overland Flow	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.1	231.9	2.5	58.0	0.6	3.1
Cat B-101	Offsite SW Corner - Overland Flow	10.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	9.3	289.9	6.2	0	0	289.9	3.2	231.9	2.5	58.0	0.6	3.2
Cat B-102	Offsite SW Corner - Overland Flow	4.5	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	3.9	289.9	2.6	0	0	289.9	1.3	231.9	1.0	58.0	0.3	1.3
Cat B-103	Offsite SW Corner - Overland Flow	4.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	3.4	289.9	2.3	0	0	289.9	1.2	231.9	0.9	58.0	0.2	1.2
Cat B-104	Offsite SW Corner - Overland Flow	19.9	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	17.1	289.9	11.3	0	0	289.9	5.8	231.9	4.6	58.0	1.2	5.8
Cat B-105	Offsite SW Corner - Overland Flow	40.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	34.8	289.9	23.0	0	0	289.9	11.8	231.9	9.4	58.0	2.4	11.8
Cat B-106	Offsite SW Corner - Overland Flow	69.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	59.2	289.9	39.2	0	0	289.9	20.0	231.9	16.0	58.0	4.0	20.0
Cat B-107	Offsite SW Corner - Overland Flow	9.4	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	8.1	289.9	5.3	0	0	289.9	2.7	231.9	2.2	58.0	0.5	2.7
Cat B-255	Offsite SW Corner - Overland Flow	485.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	416.7	301.9	270.0	0	0	301.9	146.7	211.3	102.7	90.6	44.0	146.7
Cat B-256	Offsite SW Corner - Overland Flow	86.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	74.0	301.9	48.0	0	0	301.9	26.1	211.3	18.2	90.6	7.8	26.1
Cat B-257	Offsite SW Corner - Overland Flow	5.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.3	301.9	2.8	0	0	301.9	1.5	211.3	1.1	90.6	0.5	1.5
Cat B-258	Offsite SW Corner - Overland Flow	9.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	8.5	301.9	5.5	0	0	301.9	3.0	211.3	2.1	90.6	0.9	3.0
Cat B-259	Offsite SW Corner - Overland Flow	4.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	3.4	301.9	2.2	0	0	301.9	1.2	211.3	0.8	90.6	0.4	1.2
Cat B-260	Offsite SW Corner - Overland Flow	29.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	25.6	301.9	16.6	0	0	301.9	9.0	211.3	6.3	90.6	2.7	9.0
Cat B-261	Offsite SW Corner - Overland Flow	54.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	46.7	301.9	30.3	0	0	301.9	16.5	211.3	11.5	90.6	4.9	16.5
Cat B-262	Offsite SW Corner - Overland Flow	16.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	13.7	301.9	8.9	0	0	301.9	4.8	211.3	3.4	90.6	1.5	4.8
Cat B-263	Offsite SW Corner - Overland Flow	152.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	130.5	301.9	84.6	0	0	301.9	45.9	211.3	32.2	90.6	13.8	45.9
Cat B-264	Offsite SW Corner - Overland Flow	13.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	11.8	301.9	7.7	0	0	301.9	4.2	211.3	2.9	90.6	1.2	4.2
Cat B-265	Offsite SW Corner - Overland Flow	122.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	104.9	301.9	68.0	0	0	301.9	36.9	211.3	25.9	90.6	11.1	36.9
Cat B-266	Offsite SW Corner - Overland Flow	142.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	121.8	301.9	78.9	0	0	301.9	42.9	211.3	30.0	90.6	12.9	42.9

TABLE I-1 PRE-DEVELOPMENT WATER BUDGET (BY CATCHMENT)
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat B-267	Offsite SW Corner - Overland Flow	96.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	82.6	301.9	53.5	0	0	301.9	29.1	211.3	20.3	90.6	8.7	29.1
Cat B-268	Offsite SW Corner - Overland Flow	10.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	9.4	301.9	6.1	0	0	301.9	3.3	211.3	2.3	90.6	1.0	3.3
Cat B-269	Offsite SW Corner - Overland Flow	106.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	91.3	301.9	59.1	0	0	301.9	32.1	211.3	22.5	90.6	9.6	32.1
Cat B-270	Offsite SW Corner - Overland Flow	157.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	134.8	301.9	87.3	0	0	301.9	47.4	211.3	33.2	90.6	14.2	47.4
Cat B-271	Offsite SW Corner - Overland Flow	5.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	5.1	301.9	3.3	0	0	301.9	1.8	211.3	1.2	90.6	0.5	1.8
Cat B-272	Offsite SW Corner - Overland Flow	9.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	8.5	301.9	5.5	0	0	301.9	3.0	211.3	2.1	90.6	0.9	3.0
Cat B-273	Offsite SW Corner - Overland Flow	5.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.5	301.9	2.9	0	0	301.9	1.6	211.3	1.1	90.6	0.5	1.6
Cat B-274	Offsite SW Corner - Overland Flow	13.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	11.6	301.9	7.5	0	0	301.9	4.1	211.3	2.9	90.6	1.2	4.1
Cat B-275	Offsite SW Corner - Overland Flow	4.8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.1	301.9	2.7	0	0	301.9	1.5	211.3	1.0	90.6	0.4	1.5
Cat B-276	Offsite SW Corner - Overland Flow	37.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	31.7	301.9	20.5	0	0	301.9	11.2	211.3	7.8	90.6	3.3	11.2
Cat B-277	Offsite SW Corner - Overland Flow	36.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	30.8	301.9	20.0	0	0	301.9	10.9	211.3	7.6	90.6	3.3	10.9
Cat B-278	Offsite SW Corner - Overland Flow	526.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	451.2	301.9	292.4	0	0	301.9	158.8	211.3	111.2	90.6	47.6	158.8
Cat B-279	Offsite SW Corner - Overland Flow	279.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	239.3	301.9	155.1	0	0	301.9	84.2	211.3	59.0	90.6	25.3	84.2
Cat B-280	Offsite SW Corner - Overland Flow	116.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	99.6	301.9	64.6	0	0	301.9	35.1	211.3	24.6	90.6	10.5	35.1
Cat B-281	Offsite SW Corner - Overland Flow	71.2	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	61.1	301.9	39.6	0	0	301.9	21.5	211.3	15.0	90.6	6.4	21.5
Cat B-282	Offsite SW Corner - Overland Flow	45.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	38.7	301.9	25.1	0	0	301.9	13.6	211.3	9.5	90.6	4.1	13.6
Cat B-283	Offsite SW Corner - Overland Flow	22.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	19.3	301.9	12.5	0	0	301.9	6.8	211.3	4.8	90.6	2.0	6.8
Cat B-284	Offsite SW Corner - Overland Flow	207.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	177.6	301.9	115.1	0	0	301.9	62.5	211.3	43.8	90.6	18.8	62.5
Cat B-285	Offsite SW Corner - Overland Flow	113.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	97.5	301.9	63.2	0	0	301.9	34.3	211.3	24.0	90.6	10.3	34.3
Cat B-286	Offsite SW Corner - Overland Flow	18.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	15.7	301.9	10.2	0	0	301.9	5.5	211.3	3.9	90.6	1.7	5.5
Cat B-287	Offsite SW Corner - Overland Flow	252.1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	216.2	301.9	140.1	0	0	301.9	76.1	211.3	53.3	90.6	22.8	76.1
Cat B-727	Offsite SW Corner - Overland Flow	10.1	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	8.7	301.9	5.6	0	0	301.9	3.1	211.3	2.1	90.6	0.9	3.1
Cat B-728	Offsite SW Corner - Overland Flow	5.0	Gravel	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.3	301.9	2.8	0	0	301.9	1.5	211.3	1.0	90.6	0.4	1.5
Cat B-746	Offsite SW Corner - Overland Flow	593.6	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	509.2	289.9	337.1	0	0	289.9	172.1	231.9	137.7	58.0	34.4	172.1
Cat B-747	Offsite SW Corner - Overland Flow	13.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	11.7	289.9	7.8	0	0	289.9	4.0	231.9	3.2	58.0	0.8	4.0
Cat B-748	Offsite SW Corner - Overland Flow	95.7	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	82.1	289.9	54.4	0	0	289.9	27.8	231.9	22.2	58.0	5.6	27.8
Cat B-749	Offsite SW Corner - Overland Flow	22.0	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	18.9	289.9	12.5	0	0	289.9	6.4	231.9	5.1	58.0	1.3	6.4
Cat B-750	Offsite SW Corner - Overland Flow	10.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	8.7	289.9	5.8	0	0	289.9	2.9	231.9	2.4	58.0	0.6	2.9
Cat B-751	Offsite SW Corner - Overland Flow	31.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	26.8	289.9	17.7	0	0	289.9	9.1	231.9	7.2	58.0	1.8	9.1
Cat B-752	Offsite SW Corner - Overland Flow	107.3	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	92.1	289.9	60.9	0	0	289.9	31.1	231.9	24.9	58.0	6.2	31.1
Cat B-753	Offsite SW Corner - Overland Flow	160.1	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	137.4	289.9	90.9	0	0	289.9	46.4	231.9	37.1	58.0	9.3	46.4
Cat B-754	Offsite SW Corner - Overland Flow	21.2	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	857.7	18.2	289.9	12.0	0	0	289.9	6.1	231.9	4.9	58.0	1.2	6.1
Cat B-797	Offsite SW Corner - Overland Flow	51.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	44.1	301.9	28.6	0	0	301.9	15.5	211.3	10.9	90.6	4.7	15.5
Cat B-798	Offsite SW Corner - Overland Flow	34.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	30.0	301.9	19.4	0	0	301.9	10.5	211.3	7.4	90.6	3.2	10.5
Cat B-799	Offsite SW Corner - Overland Flow	54.0	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	46.4	301.9	30.0	0	0	301.9	16.3	211.3	11.4	90.6	4.9	16.3
Cat B-800	Offsite SW Corner - Overland Flow	7.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	6.8	301.9	4.4	0	0	301.9	2.4	211.3	1.7	90.6	0.7	2.4
Cat B-801	Offsite SW Corner - Overland Flow	1.4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	1.2	301.9	0.8	0	0	301.9	0.4	211.3	0.3	90.6	0.1	0.4
Cat B-802	Offsite SW Corner - Overland Flow	244.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	209.7	301.9	135.9	0	0	301.9	73.8	211.3	51.7	90.6	22.1	73.8
Cat B-803	Offsite SW Corner - Overland Flow	3.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	3.1	301.9	2.0	0	0	301.9	1.1	211.3	0.8	90.6	0.3	1.1
Cat B-804	Offsite SW Corner - Overland Flow	10.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	8.8	301.9	5.7	0	0	301.9	3.1	211.3	2.2	90.6	0.9	3.1
Cat B-805	Offsite SW Corner - Overland Flow	22.3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	19.2	301.9	12.4	0	0	301.9	6.7	211.3	4.7	90.6	2.0	6.7
Cat B-806	Offsite SW Corner - Overland Flow	33.5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	28.7	301.9	18.6	0	0	301.9	10.1	211.3	7.1	90.6	3.0	10.1
Cat B-807	Offsite SW Corner - Overland Flow	182.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	156.6	301.9	101.5	0	0	301.9	55.1	211.3	38.6	90.6	16.5	55.1
Cat B-808	Offsite SW Corner - Overland Flow	111.7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	95.8	301.9	62.1	0	0	301.9	33.7	211.3	23.6	90.6	10.1	33.7
Cat B-809	Offsite SW Corner - Overland Flow	6.9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	5.9	301.9	3.8	0	0	301.9	2.1	211.3	1.5	90.6	0.6	2.1
Cat B-810	Offsite SW Corner - Overland Flow	4.6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	857.7	4.0	301.9	2.6	0	0	301.9	1.4	211.3	1.0	90.6	0.4	1.4
Pre-Development Catchment B Total		**6,680**								**857.7**	**5,729**	**303.8**	**3,700**	**0**	**0**	**304**	**2,029**	**216**	**1,443**	**88**	**586**	**2,029**
SITE TOTAL		**269,142**								**857.7**	**230,843**	**294.4**	**151,620**	**9**	**2,483**	**303.6**	**81,706**	**227**	**61,037**	**77**	**20,670**	**81,706**

EXTERNAL AREAS (Run-on Estimates)

Subcatchment Designation	Outlet	Area	MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation	Precipitation Total	Precipitation Surplus	Evapotranspiration	Runon		Net Surplus		Infiltration		Runoff*		Total Infiltration + Runoff
		(m^2)	Cover		Soil		Topography			(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(mm/a)	(m^3/a)	(m^3/a)
Cat C-253	On Site to Catchment A-937	22654.9	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	19431.1	292.9	12795.1	0	0	292.9	6636.0	219.7	4977.0	73.2	1659.0	6636.0
Cat C-721	On Site to Catchment A-937	1502.6	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	857.7	1288.8	283.9	862.2	0	0	283.9	426.6	241.3	362.6	42.6	64.0	426.6
Pre-Development Catchment C Total	**On Site to Catchment A-937**	**24,158**								**857.7**	**20,720**	**292.4**	**13,657**	**0**	**0**	**292**	**7,063**	**221**	**5,340**	**71**	**1,723**	**7,063**
Cat D-720	On Site to Catchment A-755	2636.5	Lawns	0.05	Silt Loam	0.4	0.25	0.70	0.7	857.7	2261.3	301.9	1465.3	0	0	301.9	796.0	211.3	557.2	90.6	238.8	796.0
Pre-Development Catchment D Total	**On Site to Catchment A-755**	**2,637**								**857.7**	**2,261**	**301.9**	**1,465**	**0**	**0**	**302**	**796**	**211**	**557**	**91**	**239**	**796**
Cat E-1	On Site to Catchment A-722	7116.8	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	857.7	6104.1	292.9	4019.5	0	0	292.9	2084.6	219.7	1563.5	73.2	521.2	2084.6
Pre-Development Catchment E Total	**On Site to Catchment A-722**	**7,117**								**857.7**	**6,104**	**292.9**	**4,019**	**0**	**0**	**293**	**2,085**	**220**	**1,563**	**73**	**521**	**2,085**

APPENDIX

J WATER BUDGET CALCULATIONS – POST DEVELOPMENT

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Total Pervious									Precipitation						Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff						
																		Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirecte	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff		Total Outputs	
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography			(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 201a-3	RLCB, offsite via storm system	11.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	11	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	9	302	3	0	0	0	858	9	6	0	6	2	2	1	0	0	0	0	0	91	1	858	9
Cat 201a-4	RLCB, offsite via storm system	61.1	100%	61.1	100%	61.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	52	0	0	772	47	0	858	52	0	5	5	0	0	0	0	47	0	0	772	47	772	47	858	52
Cat 201a-5	RLCB, offsite via storm system	15.5	100%	15.5	100%	15.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	13	0	0	772	12	0	858	13	0	1	1	0	0	0	0	12	0	0	772	12	772	12	858	13
Cat 201a-17	RLCB, offsite via storm system	12.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	13	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	11	302	4	0	0	0	858	11	7	0	7	3	3	1	0	0	0	0	0	91	1	858	11
Cat 201a-21	RLCB, offsite via storm system	27.0	100%	27.0	100%	27.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	23	0	0	772	21	0	858	23	0	2	2	0	0	0	0	21	0	0	772	21	772	21	858	23
Cat 201a-22	RLCB, offsite via storm system	26.8	100%	26.8	100%	26.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	23	0	0	772	21	0	858	23	0	2	2	0	0	0	0	21	0	0	772	21	772	21	858	23
Cat 201a-31	RLCB, offsite via storm system	309.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	310	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	266	302	93	0	0	0	858	266	172	0	172	65	65	28	0	0	0	0	0	91	28	858	266
Cat 201a-69	RLCB, offsite via storm system	2.0	100%	2.0	100%	2.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	2	0	0	772	2	0	858	2	0	0	0	0	0	0	0	2	0	0	772	2	772	2	858	2
Cat 201a-70	RLCB, offsite via storm system	132.7	100%	132.7	100%	132.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	114	0	0	772	102	0	858	114	0	11	11	0	0	0	0	102	0	0	772	102	772	102	858	114
Cat 201a-71	RLCB, offsite via storm system	177.9	100%	177.9	100%	177.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	153	0	0	772	137	0	858	153	0	15	15	0	0	0	0	137	0	0	772	137	772	137	858	153
Cat 201a-72	RLCB, offsite via storm system	23.5	100%	23.5	100%	23.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	20	0	0	772	18	0	858	20	0	2	2	0	0	0	0	18	0	0	772	18	772	18	858	20
Cat 201a-73	RLCB, offsite via storm system	162.3	100%	162.3	100%	162.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	139	0	0	772	125	0	858	139	0	14	14	0	0	0	0	125	0	0	772	125	772	125	858	139
Cat 201a-74	RLCB, offsite via storm system	158.1	100%	158.1	100%	158.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	136	0	0	772	122	0	858	136	0	14	14	0	0	0	0	122	0	0	772	122	772	122	858	136
Cat 201a-108	RLCB, offsite via storm system	1506.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,506	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	1,292	302	455	0	0	119	937	1,411	837	0	837	402	402	172	0	0	0	0	0	114	172	937	1,411
Cat 201a-176	RLCB, offsite via storm system	168.4	100%	168.4	100%	168.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	144	0	0	772	130	0	858	144	0	14	14	0	0	0	0	130	0	0	772	130	772	130	858	144
Cat 201a-177	RLCB, offsite via storm system	220.5	100%	220.5	100%	220.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	189	0	0	772	170	0	858	189	0	19	19	0	0	0	0	170	0	0	772	170	772	170	858	189
Cat 201a-178	RLCB, offsite via storm system	226.5	100%	226.5	100%	226.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	194	0	0	772	175	0	858	194	0	19	19	0	0	0	0	175	0	0	772	175	772	175	858	194
Cat 201a-179	RLCB, offsite via storm system	208.2	100%	208.2	100%	208.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	179	0	0	772	161	0	858	179	0	18	18	0	0	0	0	161	0	0	772	161	772	161	858	179
Cat 201a-180	RLCB, offsite via storm system	190.2	100%	190.2	100%	190.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	163	0	0	772	147	0	858	163	0	16	16	0	0	0	0	147	0	0	772	147	772	147	858	163
Cat 201a-181	RLCB, offsite via storm system	171.4	100%	171.4	100%	171.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	147	0	0	772	132	0	858	147	0	15	15	0	0	0	0	132	0	0	772	132	772	132	858	147
Cat 201a-182	RLCB, offsite via storm system	148.7	100%	148.7	100%	148.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	128	0	0	772	115	0	858	128	0	13	13	0	0	0	0	115	0	0	772	115	772	115	858	128
Cat 201a-183	RLCB, offsite via storm system	155.1	100%	155.1	100%	155.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	133	0	0	772	120	0	858	133	0	13	13	0	0	0	0	120	0	0	772	120	772	120	858	133
Cat 201a-184	RLCB, offsite via storm system	194.9	100%	194.9	100%	194.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	167	0	0	772	150	0	858	167	0	17	17	0	0	0	0	150	0	0	772	150	772	150	858	167
Cat 201a-185	RLCB, offsite via storm system	199.0	100%	199.0	100%	199.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	171	0	0	772	154	0	858	171	0	17	17	0	0	0	0	154	0	0	772	154	772	154	858	171
Cat 201a-279	RLCB, offsite via storm system	279.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	279	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	239	302	84	0	0	0	858	239	155	0	155	59	59	25	0	0	0	0	0	91	25	858	239
Cat 201a-284	RLCB, offsite via storm system	207.0	100%	207.0	100%	207.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	178	0	0	772	160	0	858	178	0	18	18	0	0	0	0	160	0	0	772	160	772	160	858	178
Cat 201a-285	RLCB, offsite via storm system	113.7	100%	113.7	100%	113.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	97	0	0	772	88	0	858	97	0	10	10	0	0	0	0	88	0	0	772	88	772	88	858	97
Cat 201a-286	RLCB, offsite via storm system	18.3	100%	18.3	100%	18.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	16	0	0	772	14	0	858	16	0	2	2	0	0	0	0	14	0	0	772	14	772	14	858	16
Post-Development Catchment 201a Total		**5,128**	**59%**	**3,009**	**59%**	**3,009**	**0%**	**0**	**0**	**41%**	**2,119**								**858**	**4,398**	**125**	**640**	**453**	**2,323**	**119**	**881**	**4,517**	**1,178**	**258**	**1,436**	**531**	**531**	**228**	**0**	**2,323**	**0**	**0**	**453**	**2,323**	**497**	**2,550**	**881**	**4,517**
Cat 201b-8	Offsite via CBs and storm system	22.7	100%	22.7	100%	22.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	20	0	0	772	18	0	858	20	0	2	2	0	0	0	0	18	0	0	772	18	772	18	858	20
Cat 201b-9	Offsite via CBs and storm system	2.6	100%	2.6	100%	2.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	2	0	0	772	2	0	858	2	0	0	0	0	0	0	0	2	0	0	772	2	772	2	858	2
Cat 201b-10	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-11	Offsite via CBs and storm system	16.9	100%	16.9	0%	0.0	100%	16.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	15	0	0	772	13	0	858	15	0	1	1	0	0	0	0	0	13	0	772	13	772	13	858	15
Cat 201b-12	Offsite via CBs and storm system	21.5	100%	21.5	0%	0.0	100%	21.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	18	0	0	772	17	0	858	18	0	2	2	0	0	0	0	0	17	0	772	17	772	17	858	18
Cat 201b-16	Offsite via CBs and storm system	9.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	10	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	8	302	3	0	0	0	858	8	5	0	5	2	2	1	0	0	0	0	0	91	1	858	8
Cat 201b-18	Offsite via CBs and storm system	32.6	100%	32.6	100%	32.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	28	0	0	772	25	0	858	28	0	3	3	0	0	0	0	25	0	0	772	25	772	25	858	28
Cat 201b-19	Offsite via CBs and storm system	4.4	100%	4.4	100%	4.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	4	0	0	772	3	0	858	4	0	0	0	0	0	0	0	3	0	0	772	3	772	3	858	4
Cat 201b-20	Offsite via CBs and storm system	1.4	100%	1.4	0%	0.0	100%	1.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	1	0	0	772	1	0	858	1	0	0	0	0	0	0	0	0	1	0	772	1	772	1	858	1
Cat 201b-33	Offsite via CBs and storm system	288.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	288	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	247	302	87	0	0	0	858	247	160	0	160	61	61	26	0	0	0	0	0	91	26	858	247
Cat 201b-34	Offsite via CBs and storm system	13.6	100%	13.6	100%	13.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	12	0	0	772	10	0	858	12	0	1	1	0	0	0	0	10	0	0	772	10	772	10	858	12
Cat 201b-35	Offsite via CBs and storm system	77.3	100%	77.3	100%	77.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	66	0	0	772	60	0	858	66	0	7	7	0	0	0	0	60	0	0	772	60	772	60	858	66
Cat 201b-36	Offsite via CBs and storm system	97.0	100%	97.0	100%	97.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	83	0	0	772	75	0	858	83	0	8	8	0	0	0	0	75	0	0	772	75	772	75	858	83
Cat 201b-37	Offsite via CBs and storm system	12.6	100%	12.6	100%	12.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	11	0	0	772	10	0	858	11	0	1	1	0	0	0	0	10	0	0	772	10	772	10	858	11
Cat 201b-38	Offsite via CBs and storm system	136.2	100%	136.2	100%	136.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	117	0	0	772	105	0	858	117	0	12	12	0	0	0	0	105	0	0	772	105	772	105	858	117
Cat 201b-39	Offsite via CBs and storm system	140.3	100%	140.3	100%	140.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	120	0	0	772	108	0	858	120	0	12	12	0	0	0	0	108	0	0	772	108	772	108	858	120
Cat 201b-40	Offsite via CBs and storm system	150.0	100%	150.0	100%	150.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	129	0	0	772	116	0	858	129	0	13	13	0	0	0	0	116	0	0	772	116	772	116	858	129
Cat 201b-41	Offsite via CBs and storm system	273.7	100%	273.7	100%	273.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	235	0	0	772	211	0	858	235	0	23	23	0	0	0	0	211	0	0	772	211	772	211	858	235
Cat 201b-42	Offsite via CBs and storm system	116.4	100%	116.4	100%	116.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	100	0	0	772	90	0	858	100	0	10	10	0	0	0	0	90	0	0	772	90	772	90	858	100
Cat 201b-43	Offsite via CBs and storm system	2.3	100%	2.3	100%	2.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	2	0	0	772	2	0	858	2	0	0	0	0	0	0	0	2	0	0	772	2	772	2	858	2
Cat 201b-44	Offsite via CBs and storm system	193.0	100%	193.0	100%	193.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	166	0	0	772	149	0	858	166	0	17	17	0	0	0	0	149	0	0	772	149	772	149	858	166
Cat 201b-45	Offsite via CBs and storm system	89.4	100%	89.4	100%	89.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	77	0	0	772	69	0	858	77	0	8	8	0	0	0	0	69	0	0	772	69	772	69	858	77
Cat 201b-46	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-47	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-48	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-49	Offsite via CBs and storm system	1.7	100%	1.7	0%	0.0	100%	1.7	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	1	0	0	772	1	0	858	1	0	0	0	0	0	0	0	0	1	0	772	1	772	1	858	1
Cat 201b-50	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-51	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-52	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-53	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-54	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-55	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-56	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-57	Offsite via CBs and storm system	9.1	100%	9.1	0%	0.0	100%	9.1	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	0	7	0	772	7	772	7	858	8
Cat 201b-58	Offsite via CBs and storm system	55.8	100%	55.8	0%	0.0	100%	55.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	48	0	0	772	43	0	858	48	0	5	5	0	0	0	0	0	43	0	772	43	772	43	858	48
Cat 201b-59	Offsite via CBs and storm system	60.0	100%	60.0	0%	0.0	100%	60.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	52	0	0	772	46	0	858	52	0	5	5	0	0	0	0	0	46	0	772	46	772	46	858	52
Cat 201b-60	Offsite via CBs and storm system	43.7	100%	43.7	0%	0.0	100%	43.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	37	0	0	772	34	0	858	37	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	37
Cat 201b-61	Offsite via CBs and storm system	44.7	100%	44.7	0%	0.0	100%	44.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	35	0	858	38	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	38
Cat 201b-62	Offsite via CBs and storm system	46.7	100%	46.7	0%	0.0	100%	46.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	40
Cat 201b-63	Offsite via CBs and storm system	46.8	100%	46.8	0%	0.0	100%	46.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	40
Cat 201b-64	Offsite via CBs and storm system	48.1	100%	48.1	0%	0.0	100%	48.1	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	0	37	0	772	37	772	37	858	41
Cat 201b-65	Offsite via CBs and storm system	36.7	100%	36.7	0%	0.0	100%	36.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
																		Precipitation						Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff						
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious	Total Pervious								Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirected	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff		Total Outputs	
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography		(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 201b-128	Offsite via CBs and storm system	68.9	100%	68.9	100%	68.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	59	0	0	772	53	0	858	59	0	6	6	0	0	0	0	53	0	0	772	53	772	53	858	59
Cat 201b-129	Offsite via CBs and storm system	76.6	100%	76.6	100%	76.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	66	0	0	772	59	0	858	66	0	7	7	0	0	0	0	59	0	0	772	59	772	59	858	66
Cat 201b-130	Offsite via CBs and storm system	82.8	100%	82.8	100%	82.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	71	0	0	772	64	0	858	71	0	7	7	0	0	0	0	64	0	0	772	64	772	64	858	71
Cat 201b-131	Offsite via CBs and storm system	75.3	100%	75.3	100%	75.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	65	0	0	772	58	0	858	65	0	6	6	0	0	0	0	58	0	0	772	58	772	58	858	65
Cat 201b-132	Offsite via CBs and storm system	73.8	100%	73.8	100%	73.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	63	0	0	772	57	0	858	63	0	6	6	0	0	0	0	57	0	0	772	57	772	57	858	63
Cat 201b-133	Offsite via CBs and storm system	74.6	100%	74.6	100%	74.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	64	0	0	772	58	0	858	64	0	6	6	0	0	0	0	58	0	0	772	58	772	58	858	64
Cat 201b-134	Offsite via CBs and storm system	9.2	100%	9.2	0%	0.0	100%	9.2	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	0	7	0	772	7	772	7	858	8
Cat 201b-135	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-136	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-137	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-138	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-139	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-140	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-141	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-142	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-143	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-144	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-145	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-146	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-147	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-148	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-149	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-150	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-151	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-152	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-153	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-154	Offsite via CBs and storm system	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 201b-155	Offsite via CBs and storm system	37.9	100%	37.9	0%	0.0	100%	37.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	32	0	0	772	29	0	858	32	0	3	3	0	0	0	0	29	0	0	772	29	772	29	858	32
Cat 201b-156	Offsite via CBs and storm system	45.6	100%	45.6	0%	0.0	100%	45.6	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	35	0	0	772	35	772	35	858	39
Cat 201b-157	Offsite via CBs and storm system	38.5	100%	38.5	0%	0.0	100%	38.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	33	0	0	772	30	0	858	33	0	3	3	0	0	0	0	30	0	0	772	30	772	30	858	33
Cat 201b-158	Offsite via CBs and storm system	46.8	100%	46.8	0%	0.0	100%	46.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	40
Cat 201b-159	Offsite via CBs and storm system	47.5	100%	47.5	0%	0.0	100%	47.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 201b-160	Offsite via CBs and storm system	47.5	100%	47.5	0%	0.0	100%	47.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 201b-161	Offsite via CBs and storm system	47.9	100%	47.9	0%	0.0	100%	47.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 201b-162	Offsite via CBs and storm system	48.1	100%	48.1	0%	0.0	100%	48.1	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 201b-163	Offsite via CBs and storm system	49.6	100%	49.6	0%	0.0	100%	49.6	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	43	0	0	772	38	0	858	43	0	4	4	0	0	0	0	38	0	0	772	38	772	38	858	43
Cat 201b-164	Offsite via CBs and storm system	50.9	100%	50.9	0%	0.0	100%	50.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	44	0	0	772	39	0	858	44	0	4	4	0	0	0	0	39	0	0	772	39	772	39	858	44
Cat 201b-165	Offsite via CBs and storm system	55.1	100%	55.1	0%	0.0	100%	55.1	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	47	0	0	772	43	0	858	47	0	5	5	0	0	0	0	43	0	0	772	43	772	43	858	47
Cat 201b-166	Offsite via CBs and storm system	42.4	100%	42.4	0%	0.0	100%	42.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	36	0	0	772	33	0	858	36	0	4	4	0	0	0	0	33	0	0	772	33	772	33	858	36
Cat 201b-167	Offsite via CBs and storm system	51.4	100%	51.4	0%	0.0	100%	51.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	44	0	0	772	40	0	858	44	0	4	4	0	0	0	0	40	0	0	772	40	772	40	858	44
Cat 201b-168	Offsite via CBs and storm system	39.2	100%	39.2	0%	0.0	100%	39.2	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	34	0	0	772	30	0	858	34	0	3	3	0	0	0	0	30	0	0	772	30	772	30	858	34
Cat 201b-169	Offsite via CBs and storm system	57.8	100%	57.8	0%	0.0	100%	57.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	50	0	0	772	45	0	858	50	0	5	5	0	0	0	0	45	0	0	772	45	772	45	858	50
Cat 201b-170	Offsite via CBs and storm system	42.9	100%	42.9	0%	0.0	100%	42.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	37	0	0	772	33	0	858	37	0	4	4	0	0	0	0	33	0	0	772	33	772	33	858	37
Cat 201b-171	Offsite via CBs and storm system	42.1	100%	42.1	0%	0.0	100%	42.1	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	36	0	0	772	33	0	858	36	0	4	4	0	0	0	0	33	0	0	772	33	772	33	858	36
Cat 201b-172	Offsite via CBs and storm system	57.8	100%	57.8	0%	0.0	100%	57.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	50	0	0	772	45	0	858	50	0	5	5	0	0	0	0	45	0	0	772	45	772	45	858	50
Cat 201b-173	Offsite via CBs and storm system	41.5	100%	41.5	0%	0.0	100%	41.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	36	0	0	772	32	0	858	36	0	4	4	0	0	0	0	32	0	0	772	32	772	32	858	36
Cat 201b-174	Offsite via CBs and storm system	58.4	100%	58.4	0%	0.0	100%	58.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	50	0	0	772	45	0	858	50	0	5	5	0	0	0	0	45	0	0	772	45	772	45	858	50
Cat 201b-175	Offsite via CBs and storm system	1365.8	100%	1365.8	0%	0.0	100%	1365.8	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	1,171	0	0	772	1,054	0	858	1,171	0	117	117	0	0	0	0	1,054	0	0	772	1,054	772	1,054	858	1,171
Cat 201b-203	Offsite via CBs and storm system	9.7	100%	9.7	100%	9.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	7	0	0	772	7	772	7	858	8
Cat 201b-256	Offsite via CBs and storm system	86.3	100%	86.3	100%	86.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	74	0	0	772	67	0	858	74	0	7	7	0	0	0	0	67	0	0	772	67	772	67	858	74
Cat 201b-257	Offsite via CBs and storm system	5.0	100%	5.0	100%	5.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	4	0	0	772	4	0	858	4	0	0	0	0	0	0	0	4	0	0	772	4	772	4	858	4
Cat 201b-258	Offsite via CBs and storm system	9.9	100%	9.9	0%	0.0	100%	9.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	8	0	858	8	0	1	1	0	0	0	0	8	0	0	772	8	772	8	858	8
Cat 201b-259	Offsite via CBs and storm system	4.0	100%	4.0	0%	0.0	100%	4.0	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	3	0	0	772	3	0	858	3	0	0	0	0	0	0	0	3	0	0	772	3	772	3	858	3
Cat 201b-260	Offsite via CBs and storm system	29.9	100%	29.9	0%	0.0	100%	29.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	26	0	0	772	23	0	858	26	0	3	3	0	0	0	0	23	0	0	772	23	772	23	858	26
Cat 201b-261	Offsite via CBs and storm system	54.5	100%	54.5	0%	0.0	100%	54.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	47	0	0	772	42	0	858	47	0	5	5	0	0	0	0	42	0	0	772	42	772	42	858	47
Cat 201b-262	Offsite via CBs and storm system	16.0	100%	16.0	0%	0.0	100%	16.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	14	0	0	772	12	0	858	14	0	1	1	0	0	0	0	12	0	0	772	12	772	12	858	14
Cat 201b-263	Offsite via CBs and storm system	152.2	100%	152.2	0%	0.0	100%	152.2	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	131	0	0	772	117	0	858	131	0	13	13	0	0	0	0	117	0	0	772	117	772	117	858	131
Cat 201b-264	Offsite via CBs and storm system	13.8	100%	13.8	100%	13.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	12	0	0	772	11	0	858	12	0	1	1	0	0	0	0	11	0	0	772	11	772	11	858	12
Cat 201b-265	Offsite via CBs and storm system	122.3	100%	122.3	100%	122.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	105	0	0	772	94	0	858	105	0	10	10	0	0	0	0	94	0	0	772	94	772	94	858	105
Cat 201b-266	Offsite via CBs and storm system	142.0	100%	142.0	100%	142.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	122	0	0	772	110	0	858	122	0	12	12	0	0	0	0	110	0	0	772	110	772	110	858	122
Cat 201b-267	Offsite via CBs and storm system	96.3	100%	96.3	100%	96.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	83	0	0	772	74	0	858	83	0	8	8	0	0	0	0	74	0	0	772	74	772	74	858	83
Cat 201b-282	Offsite via CBs and storm system	45.1	100%	45.1	100%	45.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	35	0	0	772	35	772	35	858	39
Cat 201b-283	Offsite via CBs and storm system	22.5	100%	22.5	100%	22.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	19	0	0	772	17	0	858	19	0	2	2	0	0	0	0	17	0	0	772	17	772	17	858	19
Cat 201b-294	Offsite via CBs and storm system	61.2	100%	61.2	100%	61.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	52	0	0	772	47	0	858	52	0	5	5	0	0	0	0	47	0	0	772	47	772	47	858	52
Cat 201b-295	Offsite via CBs and storm system	3.3	100%	3.3	100%	3.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	3	0	0	772	3	0	858	3	0	0	0	0	0	0	0	3	0	0	772	3	772	3	858	3
Cat 201b-296	Offsite via CBs and storm system	52.3	100%	52.3	0%	0.0	100%	52.3	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	45	0	0	772	40	0	858	45	0	4	4	0	0	0	0	40	0	0	772	40	772	40	858	45
Cat 201b-338	Offsite via CBs and storm system	75.1	100%	75.1	0%	0.0	100%	75.1	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	64	0	0	772	58	0	858	64	0	6	6	0	0	0	0	58	0	0	772	58	772	58	858	64
Cat 201b-727	Offsite via CBs and storm system	10.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	10	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	9	302	3	0	0	0	858	9	6	0	6	2	2	1	0	0	0	0	0	0	91	1	858	9
Cat 201b-728	Offsite via CBs and storm system	5.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	4	302	1	0	0	0	858	4	3	0	3	1	1	0	0	0	0	0	0	0	91	0	858	4
Cat 201b-729	Offsite via CBs and storm system	49.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	49	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	42	302	15	0	0	0	858	42	27	0	27	10	10	4	0	0	0	0	0	0	91	4	858	42
Cat 201b-730	Offsite via CBs and storm system	37.5	0%	0.0	0%	0.0	0%

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious		Total Pervious							Precipitation						Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff						Total Outputs
																		Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirected	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff			
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)		% of Total Area	(m^2)	Cover		Soil		Topography																					
																		(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 201b-768	Offsite via CBs and storm system	61.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	61	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	52	302	18	0	0	0	858	52	34	0	34	13	13	6	0	0	0	0	0	91	6	858	52
Cat 201b-769	Offsite via CBs and storm system	56.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	56	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	48	302	17	0	0	0	858	48	31	0	31	12	12	5	0	0	0	0	0	91	5	858	48
Cat 201b-770	Offsite via CBs and storm system	52.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	52	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	45	302	16	0	0	0	858	45	29	0	29	11	11	5	0	0	0	0	0	91	5	858	45
Cat 201b-771	Offsite via CBs and storm system	49.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	49	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	42	302	15	0	0	0	858	42	27	0	27	10	10	4	0	0	0	0	0	91	4	858	42
Cat 201b-772	Offsite via CBs and storm system	25.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	26	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	22	302	8	0	0	0	858	22	14	0	14	5	5	2	0	0	0	0	0	91	2	858	22
Cat 201b-797	Offsite via CBs and storm system	51.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	51	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	44	302	16	0	0	0	858	44	29	0	29	11	11	5	0	0	0	0	0	91	5	858	44
Cat 201b-798	Offsite via CBs and storm system	34.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	35	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	30	302	11	0	0	0	858	30	19	0	19	7	7	3	0	0	0	0	0	91	3	858	30
Cat 201b-799	Offsite via CBs and storm system	54.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	54	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	46	302	16	0	0	0	858	46	30	0	30	11	11	5	0	0	0	0	0	91	5	858	46
Cat 201b-800	Offsite via CBs and storm system	7.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	7	302	2	0	0	0	858	7	4	0	4	2	2	1	0	0	0	0	0	91	1	858	7
Cat 201b-801	Offsite via CBs and storm system	1.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	1	302	0	0	0	0	858	1	1	0	1	0	0	0	0	0	0	0	0	91	0	858	1
Cat 201b-802	Offsite via CBs and storm system	244.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	245	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	210	302	74	0	0	0	858	210	136	0	136	52	52	22	0	0	0	0	0	91	22	858	210
Cat 201b-809	Offsite via CBs and storm system	6.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	6	302	2	0	0	0	858	6	4	0	4	1	1	1	0	0	0	0	0	91	1	858	6
Cat 201b-810	Offsite via CBs and storm system	4.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	5	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	4	302	1	0	0	0	858	4	3	0	3	1	1	0	0	0	0	0	0	91	0	858	4
Cat 201b-811	Offsite via CBs and storm system	406.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	407	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	349	302	123	0	0	0	858	349	226	0	226	86	86	37	0	0	0	0	0	91	37	858	349
Cat 201b-812	Offsite via CBs and storm system	5.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	6	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	5	302	2	0	0	0	858	5	3	0	3	1	1	1	0	0	0	0	0	91	1	858	5
Cat 201b-813	Offsite via CBs and storm system	69.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	69	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	59	302	21	0	0	0	858	59	38	0	38	15	15	6	0	0	0	0	0	91	6	858	59
Cat 201b-814	Offsite via CBs and storm system	92.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	93	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	80	302	28	0	0	0	858	80	52	0	52	20	20	8	0	0	0	0	0	91	8	858	80
Cat 201b-821	Offsite via CBs and storm system	266.3	100%	266.3	0%	0.0	100%	266.3	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	228	0	0	772	206	0	858	228	0	23	23	0	0	0	0	0	206	0	772	206	772	206	858	228
Cat 201b-822	Offsite via CBs and storm system	197.0	100%	197.0	0%	0.0	100%	197.0	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	169	0	0	772	152	0	858	169	0	17	17	0	0	0	0	0	152	0	772	152	772	152	858	169
Post-Development Catchment 201b Total		**14,458**	**71%**	**10,228**	**37%**	**5,313**	**34%**	**4,915**	**0**	**29%**	**4,230**							**858**	**12,401**	**88**	**1,277**	**546**	**7,895**	**119**	**866**	**12,520**	**2,351**	**877**	**3,228**	**978**	**978**	**419**	**0**	**4,101**	**3,794**	**0**	**546**	**7,895**	**575**	**8,314**	**866**	**12,520**
Post-Development Catchment 201 Total		**19,586**	**68%**	**13,237**	**42%**	**8,322**	**25%**	**4,915**	**0**	**32%**	**6,349**							**858**	**16,799**	**98**	**1,917**	**522**	**10,218**	**239**	**870**	**17,037**	**3,528**	**1,135**	**4,664**	**1,509**	**1,509**	**647**	**0**	**6,424**	**3,794**	**0**	**522**	**10,218**	**555**	**10,865**	**870**	**17,037**
Cat 202a-7	Off-site via on-site storm system and Stormtech	10.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	10	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	9	302	3	0	0	0	858	9	6	0	6	2	2	1	0	0	0	0	0	91	1	858	9
Cat 202a-13	Off-site via on-site storm system and Stormtech	22.9	100%	22.9	100%	22.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	20	0	0	772	18	0	858	20	0	2	2	0	0	0	0	18	0	0	772	18	772	18	858	20
Cat 202a-14	Off-site via on-site storm system and Stormtech	5.6	100%	5.6	0%	0.0	100%	5.6	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	5	0	0	772	4	0	858	5	0	0	0	0	0	0	0	0	4	0	772	4	772	4	858	5
Cat 202a-15	Off-site via on-site storm system and Stormtech	14.5	100%	14.5	0%	0.0	100%	14.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	12	0	0	772	11	0	858	12	0	1	1	0	0	0	0	0	11	0	772	11	772	11	858	12
Cat 202a-84	Off-site via on-site storm system and Stormtech	9.2	100%	9.2	100%	9.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	7	0	0	772	7	772	7	858	8
Cat 202a-85	Off-site via on-site storm system and Stormtech	95.4	100%	95.4	100%	95.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	82	0	0	772	74	0	858	82	0	8	8	0	0	0	0	74	0	0	772	74	772	74	858	82
Cat 202a-86	Off-site via on-site storm system and Stormtech	4.5	100%	4.5	100%	4.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	4	0	0	772	3	0	858	4	0	0	0	0	0	0	0	3	0	0	772	3	772	3	858	4
Cat 202a-87	Off-site via on-site storm system and Stormtech	28.9	100%	28.9	0%	0.0	100%	28.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	25	0	0	772	22	0	858	25	0	2	2	0	0	0	0	0	22	0	772	22	772	22	858	25
Cat 202a-88	Off-site via on-site storm system and Stormtech	63.5	100%	63.5	0%	0.0	100%	63.5	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	54	0	0	772	49	0	858	54	0	5	5	0	0	0	0	0	49	0	772	49	772	49	858	54
Cat 202a-89	Off-site via on-site storm system and Stormtech	323.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	323	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	277	302	98	0	0	0	858	277	180	0	180	68	68	29	0	0	0	0	0	91	29	858	277
Cat 202a-92	Off-site via on-site storm system and Stormtech	6.0	100%	6.0	100%	6.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	5	0	0	772	5	0	858	5	0	1	1	0	0	0	0	5	0	0	772	5	772	5	858	5
Cat 202a-93	Off-site via on-site storm system and Stormtech	66.8	100%	66.8	100%	66.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	57	0	0	772	52	0	858	57	0	6	6	0	0	0	0	52	0	0	772	52	772	52	858	57
Cat 202a-94	Off-site via on-site storm system and Stormtech	129.3	100%	129.3	100%	129.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	111	0	0	772	100	0	858	111	0	11	11	0	0	0	0	100	0	0	772	100	772	100	858	111
Cat 202a-95	Off-site via on-site storm system and Stormtech	225.3	100%	225.3	100%	225.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	193	0	0	772	174	0	858	193	0	19	19	0	0	0	0	174	0	0	772	174	772	174	858	193
Cat 202a-96	Off-site via on-site storm system and Stormtech	89.8	100%	89.8	100%	89.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	77	0	0	772	69	0	858	77	0	8	8	0	0	0	0	69	0	0	772	69	772	69	858	77
Cat 202a-97	Off-site via on-site storm system and Stormtech	117.3	100%	117.3	100%	117.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	101	0	0	772	91	0	858	101	0	10	10	0	0	0	0	91	0	0	772	91	772	91	858	101
Cat 202a-98	Off-site via on-site storm system and Stormtech	73.1	100%	73.1	100%	73.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	63	0	0	772	56	0	858	63	0	6	6	0	0	0	0	56	0	0	772	56	772	56	858	63
Cat 202a-99	Off-site via on-site storm system and Stormtech	9.9	100%	9.9	0%	0.0	100%	9.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	8	0	858	8	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	8
Cat 202a-100	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-101	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-102	Off-site via on-site storm system and Stormtech	4.5	100%	4.5	0%	0.0	100%	4.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	4	0	0	772	3	0	858	4	0	0	0	0	0	0	0	0	3	0	772	3	772	3	858	4
Cat 202a-103	Off-site via on-site storm system and Stormtech	4.0	100%	4.0	0%	0.0	100%	4.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	3	0	0	772	3	0	858	3	0	0	0	0	0	0	0	0	3	0	772	3	772	3	858	3
Cat 202a-104	Off-site via on-site storm system and Stormtech	19.9	100%	19.9	0%	0.0	100%	19.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	17	0	0	772	15	0	858	17	0	2	2	0	0	0	0	0	15	0	772	15	772	15	858	17
Cat 202a-105	Off-site via on-site storm system and Stormtech	40.6	100%	40.6	0%	0.0	100%	40.6	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	35	0	0	772	31	0	858	35	0	3	3	0	0	0	0	0	31	0	772	31	772	31	858	35
Cat 202a-106	Off-site via on-site storm system and Stormtech	69.0	100%	69.0	0%	0.0	100%	69.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	59	0	0	772	53	0	858	59	0	6	6	0	0	0	0	0	53	0	772	53	772	53	858	59
Cat 202a-107	Off-site via on-site storm system and Stormtech	9.4	80%	7.5	0%	0.0	100%	7.5	0.0	20%	2	Concrete	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	6	0	858	8	2	1	2	0	0	0	0	0	6	0	618	6	618	6	858	8
Cat 202a-110	Off-site via on-site storm system and Stormtech	67.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	67	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	58	302	20	0	0	0	858	58	37	0	37	14	14	6	0	0	0	0	0	91	6	858	58
Cat 202a-111	Off-site via on-site storm system and Stormtech	386.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	386	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	331	302	117	0	0	0	858	331	215	0	215	82	82	35	0	0	0	0	0	91	35	858	331
Cat 202a-198	Off-site via on-site storm system and Stormtech	14.6	100%	14.6	100%	14.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	13	0	0	772	11	0	858	13	0	1	1	0	0	0	0	11	0	0	772	11	772	11	858	13
Cat 202a-199	Off-site via on-site storm system and Stormtech	49.3	100%	49.3	100%	49.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	42	0	0	772	38	0	858	42	0	4	4	0	0	0	0	38	0	0	772	38	772	38	858	42
Cat 202a-200	Off-site via on-site storm system and Stormtech	111.5	100%	111.5	100%	111.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	96	0	0	772	86	0	858	96	0	10	10	0	0	0	0	86	0	0	772	86	772	86	858	96
Cat 202a-201	Off-site via on-site storm system and Stormtech	147.4	100%	147.4	100%	147.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	126	0	0	772	114	0	858	126	0	13	13	0	0	0	0	114	0	0	772	114	772	114	858	126
Cat 202a-202	Off-site via on-site storm system and Stormtech	72.3	100%	72.3	100%	72.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	62	0	0	772	56	0	858	62	0	6	6	0	0	0	0	56	0	0	772	56	772	56	858	62
Cat 202a-204	Off-site via on-site storm system and Stormtech	117.7	100%	117.7	100%	117.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	101	0	0	772	91	0	858	101	0	10	10	0	0	0	0	91	0	0	772	91	772	91	858	101
Cat 202a-205	Off-site via on-site storm system and Stormtech	50.3	100%	50.3	100%	50.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	43	0	0	772	39	0	858	43	0	4	4	0	0	0	0	39	0	0	772	39	772	39	858	43
Cat 202a-206	Off-site via on-site storm system and Stormtech	274.9	100%	274.9	100%	274.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	236	0	0	772	212	0	858	236	0	24	24	0	0	0	0	212	0	0	772	212	772	212	858	236
Cat 202a-207	Off-site via on-site storm system and Stormtech	274.9	100%	274.9	100%	274.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	236	0	0	772	212	0	858	236	0	24	24	0	0	0	0	212	0	0	772	212	772	212	858	236
Cat 202a-208	Off-site via on-site storm system and Stormtech	219.6	100%	219.6	100%	219.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	188	0	0	772	170	0	858	188	0	19	19	0	0	0	0	170	0	0	772	170	772	170	858	188
Cat 202a-209	Off-site via on-site storm system and Stormtech	63.5	100%	63.5	100%	63.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	54	0	0	772	49	0	858	54	0	5	5	0	0	0	0	49	0	0	772	49	772	49	858	54
Cat 202a-210	Off-site via on-site storm system and Stormtech	49.3	100%	49.3	100%	49.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	42	0	0	772	38	0	858	42	0	4	4	0	0	0	0	38	0	0	772	38	772	38	858	42
Cat 202a-211	Off-site via on-site storm system and Stormtech	163.4	100%	163.4	100%	163.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	140	0	0	772	126	0	858	140	0	14	14	0	0	0	0	126	0	0	772	126	772	126	858	140
Cat 202a-212	Off-site via on-site storm system and Stormtech	127.5	100%	127.5	100%	127.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	109	0	0	772	98	0	858	109	0	11	11	0	0	0	0	98	0	0	772	98	772	98	858	109
Cat 202a-213	Off-site via on-site storm system and Stormtech	46.0	100%	46.0	100%	46.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	36	0	858	39	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	39
Cat 202a-214	Off-site via on-site storm system and Stormtech	208.4	100%	208.4	100%	208.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	179	0	0	772	161	0	858	179	0	18	18	0	0	0	0	161	0	0	772	161	772	161	858	179
Cat 202a-215	Off-site via on-site storm system and Stormtech	50.8	100%	50.8	100%	50.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	44	0	0	772	39	0	858	44	0	4	4	0	0	0	0	39	0	0	772	39	772	39	858	44
Cat 202a-216	Off-site via on-site storm system and Stormtech	6.9	100%	6.9	100%	6.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	6	0	0	772	5	0	858	6	0	1	1	0	0	0	0	5	0	0	772	5	772	5	858	6
Cat 202a-217	Off-site via on-site storm system and Stormtech	253.4	100%	253.4	100%	253.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	217	0	0	772	196	0	858	217	0	22	22	0	0	0	0	196	0	0	772	196	772	196	858	217
Cat 202a-218	Off-site via on-site storm system and Stormtech	20.6	100%	20.6	100%	20.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	18	0	0	772	16	0	858	18	0	2	2	0	0	0	0	16	0	0	772	16	772	16	858	18
Cat 202a-219	Off-site via on-site storm system and Stormtech	48.7	100%	48.7	100%	48.7

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious	Total Pervious								Precipitation						Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff						Total Outputs
																		Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirected	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff			
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography			(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m3/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 202a-243	Off-site via on-site storm system and Stormtech	53.5	100%	53.5	0%	0.0	100%	53.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	46	0	0	772	41	0	858	46	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	46
Cat 202a-244	Off-site via on-site storm system and Stormtech	48.7	100%	48.7	0%	0.0	100%	48.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	42	0	0	772	38	0	858	42	0	4	4	0	0	0	0	0	38	0	772	38	772	38	858	42
Cat 202a-245	Off-site via on-site storm system and Stormtech	47.5	100%	47.5	0%	0.0	100%	47.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	0	37	0	772	37	772	37	858	41
Cat 202a-246	Off-site via on-site storm system and Stormtech	43.1	100%	43.1	0%	0.0	100%	43.1	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	37	0	0	772	33	0	858	37	0	4	4	0	0	0	0	0	33	0	772	33	772	33	858	37
Cat 202a-247	Off-site via on-site storm system and Stormtech	25.9	100%	25.9	0%	0.0	100%	25.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	22	0	0	772	20	0	858	22	0	2	2	0	0	0	0	0	20	0	772	20	772	20	858	22
Cat 202a-248	Off-site via on-site storm system and Stormtech	44.8	100%	44.8	0%	0.0	100%	44.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	35	0	858	38	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	38
Cat 202a-249	Off-site via on-site storm system and Stormtech	18.9	100%	18.9	0%	0.0	100%	18.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	16	0	0	772	15	0	858	16	0	2	2	0	0	0	0	0	15	0	772	15	772	15	858	16
Cat 202a-250	Off-site via on-site storm system and Stormtech	128.4	80%	102.7	0%	0.0	100%	102.7	0.0	20%	26	Concrete	0	Silt Loam	0.4	0.25	0.65	0	858	110	0	0	772	79	0	858	110	22	9	31	0	0	0	0	0	79	0	618	79	618	79	858	110
Cat 202a-251	Off-site via on-site storm system and Stormtech	28.6	80%	22.9	0%	0.0	100%	22.9	0.0	20%	6	Concrete	0	Silt Loam	0.4	0.25	0.65	0	858	25	0	0	772	18	0	858	25	5	2	7	0	0	0	0	0	18	0	618	18	618	18	858	25
Cat 202a-268	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	100%	10.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	8	0	0	772	8	772	8	858	9
Cat 202a-269	Off-site via on-site storm system and Stormtech	106.4	100%	106.4	100%	106.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	91	0	0	772	82	0	858	91	0	9	9	0	0	0	0	82	0	0	772	82	772	82	858	91
Cat 202a-270	Off-site via on-site storm system and Stormtech	157.2	100%	157.2	100%	157.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	135	0	0	772	121	0	858	135	0	13	13	0	0	0	0	121	0	0	772	121	772	121	858	135
Cat 202a-271	Off-site via on-site storm system and Stormtech	5.9	100%	5.9	0%	0.0	100%	5.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	5	0	0	772	5	0	858	5	0	1	1	0	0	0	0	0	5	0	772	5	772	5	858	5
Cat 202a-272	Off-site via on-site storm system and Stormtech	9.9	100%	9.9	0%	0.0	100%	9.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	8	0	858	8	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	8
Cat 202a-273	Off-site via on-site storm system and Stormtech	5.3	100%	5.3	0%	0.0	100%	5.3	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	5	0	0	772	4	0	858	5	0	0	0	0	0	0	0	0	4	0	772	4	772	4	858	5
Cat 202a-274	Off-site via on-site storm system and Stormtech	13.5	100%	13.5	0%	0.0	100%	13.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	12	0	0	772	10	0	858	12	0	1	1	0	0	0	0	0	10	0	772	10	772	10	858	12
Cat 202a-275	Off-site via on-site storm system and Stormtech	4.8	100%	4.8	0%	0.0	100%	4.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	4	0	0	772	4	0	858	4	0	0	0	0	0	0	0	0	4	0	772	4	772	4	858	4
Cat 202a-276	Off-site via on-site storm system and Stormtech	37.0	100%	37.0	0%	0.0	100%	37.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	32	0	0	772	29	0	858	32	0	3	3	0	0	0	0	0	29	0	772	29	772	29	858	32
Cat 202a-277	Off-site via on-site storm system and Stormtech	36.0	100%	36.0	0%	0.0	100%	36.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	31	0	0	772	28	0	858	31	0	3	3	0	0	0	0	0	28	0	772	28	772	28	858	31
Cat 202a-278	Off-site via on-site storm system and Stormtech	526.1	100%	526.1	0%	0.0	100%	526.1	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	451	0	0	772	406	0	858	451	0	45	45	0	0	0	0	0	406	0	772	406	772	406	858	451
Cat 202a-281	Off-site via on-site storm system and Stormtech	71.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	71	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	61	302	21	0	0	0	858	61	40	0	40	15	15	6	0	0	0	0	91	6	858	61	858	61
Cat 202a-287	Off-site via on-site storm system and Stormtech	252.1	100%	252.1	100%	252.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	216	0	0	772	195	0	858	216	0	22	22	0	0	0	0	195	0	0	772	195	772	195	858	216
Cat 202a-305	Off-site via on-site storm system and Stormtech	12.3	100%	12.3	100%	12.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	11	0	0	772	9	0	858	11	0	1	1	0	0	0	0	9	0	0	772	9	772	9	858	11
Cat 202a-306	Off-site via on-site storm system and Stormtech	82.6	100%	82.6	100%	82.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	71	0	0	772	64	0	858	71	0	7	7	0	0	0	0	64	0	0	772	64	772	64	858	71
Cat 202a-307	Off-site via on-site storm system and Stormtech	25.7	80%	20.6	0%	0.0	100%	20.6	0.0	20%	5	Concrete	0	Silt Loam	0.4	0.25	0.65	0	858	22	0	0	772	16	0	858	22	4	2	6	0	0	0	0	0	16	0	618	16	618	16	858	22
Cat 202a-310	Off-site via on-site storm system and Stormtech	76.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	77	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	66	302	23	0	0	0	858	66	43	0	43	16	16	7	0	0	0	0	0	0	91	7	858	66
Cat 202a-322	Off-site via on-site storm system and Stormtech	70.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	70	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	60	302	21	0	0	0	858	60	39	0	39	15	15	6	0	0	0	0	0	0	91	6	858	60
Cat 202a-617	Off-site via on-site storm system and Stormtech	91.9	100%	91.9	0%	0.0	100%	91.9	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	79	0	0	772	71	0	858	79	0	8	8	0	0	0	0	0	71	0	772	71	772	71	858	79
Cat 202a-648	Off-site via on-site storm system and Stormtech	30.7	100%	30.7	100%	30.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	26	0	0	772	24	0	858	26	0	3	3	0	0	0	0	24	0	0	772	24	772	24	858	26
Cat 202a-649	Off-site via on-site storm system and Stormtech	28.9	100%	28.9	100%	28.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	25	0	0	772	22	0	858	25	0	2	2	0	0	0	0	22	0	0	772	22	772	22	858	25
Cat 202a-650	Off-site via on-site storm system and Stormtech	23.5	100%	23.5	100%	23.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	20	0	0	772	18	0	858	20	0	2	2	0	0	0	0	18	0	0	772	18	772	18	858	20
Cat 202a-651	Off-site via on-site storm system and Stormtech	161.8	100%	161.8	100%	161.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	139	0	0	772	125	0	858	139	0	14	14	0	0	0	0	125	0	0	772	125	772	125	858	139
Cat 202a-652	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-653	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-654	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-655	Off-site via on-site storm system and Stormtech	40.0	100%	40.0	0%	0.0	100%	40.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	34	0	0	772	31	0	858	34	0	3	3	0	0	0	0	0	31	0	772	31	772	31	858	34
Cat 202a-656	Off-site via on-site storm system and Stormtech	57.3	100%	57.3	0%	0.0	100%	57.3	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	49	0	0	772	44	0	858	49	0	5	5	0	0	0	0	0	44	0	772	44	772	44	858	49
Cat 202a-657	Off-site via on-site storm system and Stormtech	52.4	100%	52.4	0%	0.0	100%	52.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	45	0	0	772	40	0	858	45	0	4	4	0	0	0	0	0	40	0	772	40	772	40	858	45
Cat 202a-658	Off-site via on-site storm system and Stormtech	909.2	100%	909.2	0%	0.0	100%	909.2	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	780	0	0	772	702	0	858	780	0	78	78	0	0	0	0	0	702	0	772	702	772	702	858	780
Cat 202a-659	Off-site via on-site storm system and Stormtech	23.8	80%	19.0	0%	0.0	100%	19.0	0.0	20%	5	Concrete	0	Silt Loam	0.4	0.25	0.65	0	858	20	0	0	772	15	0	858	20	4	2	6	0	0	0	0	0	15	0	618	15	618	15	858	20
Cat 202a-660	Off-site via on-site storm system and Stormtech	249.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	249	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	214	302	75	0	0	0	858	214	138	0	138	53	53	23	0	0	0	0	0	0	91	23	858	214
Cat 202a-661	Off-site via on-site storm system and Stormtech	3.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	3	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	3	302	1	0	0	0	858	3	2	0	2	1	1	0	0	0	0	0	0	0	91	0	858	3
Cat 202a-663	Off-site via on-site storm system and Stormtech	41.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	42	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	36	302	13	0	0	0	858	36	23	0	23	9	9	4	0	0	0	0	0	0	91	4	858	36
Cat 202a-670	Off-site via on-site storm system and Stormtech	33.2	100%	33.2	100%	33.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	28	0	0	772	26	0	858	28	0	3	3	0	0	0	0	26	0	0	772	26	772	26	858	28
Cat 202a-671	Off-site via on-site storm system and Stormtech	43.1	100%	43.1	100%	43.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	37	0	0	772	33	0	858	37	0	4	4	0	0	0	0	33	0	0	772	33	772	33	858	37
Cat 202a-672	Off-site via on-site storm system and Stormtech	116.2	100%	116.2	100%	116.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	100	0	0	772	90	0	858	100	0	10	10	0	0	0	0	90	0	0	772	90	772	90	858	100
Cat 202a-673	Off-site via on-site storm system and Stormtech	12.4	100%	12.4	100%	12.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	11	0	0	772	10	0	858	11	0	1	1	0	0	0	0	10	0	0	772	10	772	10	858	11
Cat 202a-674	Off-site via on-site storm system and Stormtech	20.0	100%	20.0	100%	20.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	17	0	0	772	15	0	858	17	0	2	2	0	0	0	0	15	0	0	772	15	772	15	858	17
Cat 202a-675	Off-site via on-site storm system and Stormtech	48.3	100%	48.3	100%	48.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 202a-676	Off-site via on-site storm system and Stormtech	59.0	100%	59.0	100%	59.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	51	0	0	772	46	0	858	51	0	5	5	0	0	0	0	46	0	0	772	46	772	46	858	51
Cat 202a-677	Off-site via on-site storm system and Stormtech	147.7	100%	147.7	100%	147.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	127	0	0	772	114	0	858	127	0	13	13	0	0	0	0	114	0	0	772	114	772	114	858	127
Cat 202a-678	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-679	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-680	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-681	Off-site via on-site storm system and Stormtech	8.1	100%	8.1	0%	0.0	100%	8.1	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	7	0	0	772	6	0	858	7	0	1	1	0	0	0	0	0	6	0	772	6	772	6	858	7
Cat 202a-682	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-683	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-684	Off-site via on-site storm system and Stormtech	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 202a-685	Off-site via on-site storm system and Stormtech	46.5	100%	46.5	0%	0.0	100%	46.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	40
Cat 202a-686	Off-site via on-site storm system and Stormtech	50.7	100%	50.7	0%	0.0	100%	50.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	43	0	0	772	39	0	858	43	0	4	4	0	0	0	0	0	39	0	772	39	772	39	858	43
Cat 202a-687	Off-site via on-site storm system and Stormtech	4.5	100%	4.5	0%	0.0	100%	4.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	4	0	0	772	3	0	858	4	0	0	0	0	0	0	0	0	3	0	772	3	772	3	858	4
Cat 202a-688	Off-site via on-site storm system and Stormtech	34.9	100%	34.9	0%	0.0	100%	34.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	30	0	0	772	27	0	858	30	0	3	3	0	0	0	0	0	27	0	772	27	772	27	858	30
Cat 202a-689	Off-site via on-site storm system and Stormtech	53.2	100%	53.2	0%	0.0	100%	53.2	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	46	0	0	772	41	0	858	46	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	46
Cat 202a-690	Off-site via on-site storm system and Stormtech	48.5	100%	48.5	0%	0.0	100%	48.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	42	0	0	772	37	0	858	42	0	4	4	0	0	0	0	0	37	0	772	37	772	37	858	42
Cat 202a-691	Off-site via on-site storm system and Stormtech	45.9	100%	45.9	0%	0.0	100%	45.9	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	39
Cat 202a-692	Off-site via on-site storm system and Stormtech	44.0	100%	44.0	0%	0.0	100%	44.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	34	0	858	38	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	38
Cat 202a-693	Off-site via on-site storm system and Stormtech	44.4	100%	44.4	0%	0.0	100%	44.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	34	0	858	38	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	38
Cat 202a-694	Off-site via on-site storm system and Stormtech	954.2	100%	954.2	0%	0.0	100%	954.2	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	818	0	0	772	737	0	858	818	0	82	82	0	0	0	0	0	737	0	772	737	772	737	858	818
Cat 202a-698	Off-site via on-site storm system and Stormtech	121.1	100%	121.1	100%	121.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious							Pervious									Inputs								Outputs															
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious	Total Pervious		MOE TABLE 2 Components				MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Precipitation						Run-on	Total Inputs			Evapotranspiration			Infiltration		Pervious	Landscaped Area Redirected	Building	Runoff			Total Impervious		Total Runoff		Total Outputs	
																		Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration				Road/ Driveway/ Amenities	Other Impervious						
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography		(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 202a-748	Off-site via on-site storm system and Stormtech	95.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	96	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	82	302	29	0	0	0	858	82	53	0	53	20	20	9	0	0	0	0	0	91	9	858	82
Cat 202a-749	Off-site via on-site storm system and Stormtech	22.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	22	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	19	302	7	0	0	0	858	19	12	0	12	5	5	2	0	0	0	0	0	91	2	858	19
Cat 202a-750	Off-site via on-site storm system and Stormtech	10.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	10	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	9	302	3	0	0	0	858	9	6	0	6	2	2	1	0	0	0	0	0	91	1	858	9
Cat 202a-751	Off-site via on-site storm system and Stormtech	31.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	31	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	27	302	9	0	0	0	858	27	17	0	17	7	7	3	0	0	0	0	0	91	3	858	27
Cat 202a-752	Off-site via on-site storm system and Stormtech	107.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	107	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	92	302	32	0	0	0	858	92	60	0	60	23	23	10	0	0	0	0	0	91	10	858	92
Cat 202a-753	Off-site via on-site storm system and Stormtech	160.1	100%	160.1	0%	0.0	100%	160.1	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	137	0	0	772	124	0	858	137	0	14	14	0	0	0	0	0	124	0	772	124	772	124	858	137
Cat 202a-754	Off-site via on-site storm system and Stormtech	21.2	100%	21.2	0%	0.0	100%	21.2	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	18	0	0	772	16	0	858	18	0	2	2	0	0	0	0	0	16	0	772	16	772	16	858	18
Cat 202a-775	Off-site via on-site storm system and Stormtech	49.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	49	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	42	302	15	0	0	0	858	42	27	0	27	10	10	4	0	0	0	0	0	91	4	858	42
Cat 202a-776	Off-site via on-site storm system and Stormtech	48.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	48	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	41	302	15	0	0	0	858	41	27	0	27	10	10	4	0	0	0	0	0	91	4	858	41
Cat 202a-777	Off-site via on-site storm system and Stormtech	66.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	66	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	57	302	20	0	0	0	858	57	37	0	37	14	14	6	0	0	0	0	0	91	6	858	57
Cat 202a-778	Off-site via on-site storm system and Stormtech	14.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	15	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	13	302	4	0	0	0	858	13	8	0	8	3	3	1	0	0	0	0	0	91	1	858	13
Cat 202a-779	Off-site via on-site storm system and Stormtech	690.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	690	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	592	302	208	0	0	0	858	592	384	0	384	146	146	63	0	0	0	0	0	91	63	858	592
Cat 202a-780	Off-site via on-site storm system and Stormtech	100.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	101	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	87	302	30	0	0	0	858	87	56	0	56	21	21	9	0	0	0	0	0	91	9	858	87
Cat 202a-781	Off-site via on-site storm system and Stormtech	66.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	66	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	57	302	20	0	0	0	858	57	37	0	37	14	14	6	0	0	0	0	0	91	6	858	57
Cat 202a-782	Off-site via on-site storm system and Stormtech	20.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	20	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	18	302	6	0	0	0	858	18	11	0	11	4	4	2	0	0	0	0	0	91	2	858	18
Cat 202a-783	Off-site via on-site storm system and Stormtech	54.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	55	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	47	302	17	0	0	0	858	47	30	0	30	12	12	5	0	0	0	0	0	91	5	858	47
Cat 202a-784	Off-site via on-site storm system and Stormtech	60.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	60	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	52	302	18	0	0	0	858	52	34	0	34	13	13	5	0	0	0	0	0	91	5	858	52
Cat 202a-785	Off-site via on-site storm system and Stormtech	9.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	10	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	8	302	3	0	0	0	858	8	5	0	5	2	2	1	0	0	0	0	0	91	1	858	8
Cat 202a-786	Off-site via on-site storm system and Stormtech	56.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	56	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	48	302	17	0	0	0	858	48	31	0	31	12	12	5	0	0	0	0	0	91	5	858	48
Cat 202a-787	Off-site via on-site storm system and Stormtech	83.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	84	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	72	302	25	0	0	0	858	72	47	0	47	18	18	8	0	0	0	0	0	91	8	858	72
Cat 202a-788	Off-site via on-site storm system and Stormtech	374.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	374	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	321	302	113	0	0	0	858	321	208	0	208	79	79	34	0	0	0	0	0	91	34	858	321
Cat 202a-789	Off-site via on-site storm system and Stormtech	15.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	16	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	13	302	5	0	0	0	858	13	9	0	9	3	3	1	0	0	0	0	0	91	1	858	13
Cat 202a-790	Off-site via on-site storm system and Stormtech	785.1	100%	785.1	0%	0.0	100%	785.1	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	673	0	0	772	606	0	858	673	0	67	67	0	0	0	0	0	606	0	772	606	772	606	858	673
Cat 202a-791	Off-site via on-site storm system and Stormtech	600.2	100%	600.2	0%	0.0	100%	600.2	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	515	0	0	772	463	0	858	515	0	51	51	0	0	0	0	0	463	0	772	463	772	463	858	515
Cat 202a-803	Off-site via on-site storm system and Stormtech	3.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	3	302	1	0	0	0	858	3	2	0	2	1	1	0	0	0	0	0	0	91	0	858	3
Cat 202a-804	Off-site via on-site storm system and Stormtech	10.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	10	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	9	302	3	0	0	0	858	9	6	0	6	2	2	1	0	0	0	0	0	91	1	858	9
Cat 202a-805	Off-site via on-site storm system and Stormtech	22.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	22	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	19	302	7	0	0	0	858	19	12	0	12	5	5	2	0	0	0	0	0	91	2	858	19
Cat 202a-806	Off-site via on-site storm system and Stormtech	33.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	33	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	29	302	10	0	0	0	858	29	19	0	19	7	7	3	0	0	0	0	0	91	3	858	29
Cat 202a-807	Off-site via on-site storm system and Stormtech	182.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	183	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	157	302	55	0	0	0	858	157	101	0	101	39	39	17	0	0	0	0	0	91	17	858	157
Cat 202a-808	Off-site via on-site storm system and Stormtech	111.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	112	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	96	302	34	0	0	0	858	96	62	0	62	24	24	10	0	0	0	0	0	91	10	858	96
Cat 202a-819	Off-site via on-site storm system and Stormtech	103.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	103	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	89	302	31	0	0	0	858	89	57	0	57	22	22	9	0	0	0	0	0	91	9	858	89
Cat 202a-820	Off-site via on-site storm system and Stormtech	26.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	26	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	23	302	8	0	0	0	858	23	15	0	15	6	6	2	0	0	0	0	0	91	2	858	23
Cat 202a-825	Off-site via on-site storm system and Stormtech	56.7	100%	56.7	0%	0.0	100%	56.7	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	49	0	0	772	44	0	858	49	0	5	5	0	0	0	0	0	44	0	772	44	772	44	858	49
Cat 202a-826	Off-site via on-site storm system and Stormtech	5.8	100%	5.8	0%	0.0	100%	5.8	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	5	0	0	772	4	0	858	5	0	0	0	0	0	0	0	0	4	0	772	4	772	4	858	5
Cat 202a-901	Off-site via on-site storm system and Stormtech	69.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	70	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	60	302	21	0	0	0	858	60	39	0	39	15	15	6	0	0	0	0	0	91	6	858	60
Cat 202a-902	Off-site via on-site storm system and Stormtech	98.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	99	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	85	302	30	0	0	0	858	85	55	0	55	21	21	9	0	0	0	0	0	91	9	858	85
Cat 202a-903	Off-site via on-site storm system and Stormtech	70.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	70	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	60	302	21	0	0	0	858	60	39	0	39	15	15	6	0	0	0	0	0	91	6	858	60
Cat 202a-904	Off-site via on-site storm system and Stormtech	69.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	69	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	59	302	21	0	0	0	858	59	38	0	38	15	15	6	0	0	0	0	0	91	6	858	59
Cat 202a-905	Off-site via on-site storm system and Stormtech	35.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	35	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	30	302	11	0	0	0	858	30	20	0	20	7	7	3	0	0	0	0	0	91	3	858	30
Cat 202a-906	Off-site via on-site storm system and Stormtech	11.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	12	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	10	302	3	0	0	0	858	10	6	0	6	2	2	1	0	0	0	0	0	91	1	858	10
Cat 202a-907	Off-site via on-site storm system and Stormtech	15.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	16	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	14	302	5	0	0	0	858	14	9	0	9	3	3	1	0	0	0	0	0	91	1	858	14
Cat 202a-913	Off-site via on-site storm system and Stormtech	8.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	8	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	7	302	2	0	0	0	858	7	5	0	5	2	2	1	0	0	0	0	0	91	1	858	7
Cat 202a-914	Off-site via on-site storm system and Stormtech	74.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	75	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	64	302	23	0	0	0	858	64	42	0	42	16	16	7	0	0	0	0	0	91	7	858	64
Cat 202a-915	Off-site via on-site storm system and Stormtech	75.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	75	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	64	302	23	0	0	0	858	64	42	0	42	16	16	7	0	0	0	0	0	91	7	858	64
Cat 202a-916	Off-site via on-site storm system and Stormtech	107.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	107	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	92	302	32	0	0	0	858	92	60	0	60	23	23	10	0	0	0	0	0	91	10	858	92
Cat 202a-917	Off-site via on-site storm system and Stormtech	48.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	49	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	42	302	15	0	0	0	858	42	27	0	27	10	10	4	0	0	0	0	0	91	4	858	42
Cat 202a-918	Off-site via on-site storm system and Stormtech	60.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	61	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	52	302	18	0	0	0	858	52	34	0	34	13	13	6	0	0	0	0	0	91	6	858	52
Cat 202a-919	Off-site via on-site storm system and Stormtech	10.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	11	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	9	302	3	0	0	0	858	9	6	0	6	2	2	1	0	0	0	0	0	91	1	858	9
Cat 202a-920	Off-site via on-site storm system and Stormtech	98.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	99	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	85	302	30	0	0	0	858	85	55	0	55	21	21	9	0	0	0	0	0	91	9	858	85
Cat 202a-921	Off-site via on-site storm system and Stormtech	31.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	31	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	27	302	9	0	0	0	858	27	17	0	17	7	7	3	0	0	0	0	0	91	3	858	27
Cat 202a-922	Off-site via on-site storm system and Stormtech	44.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	44	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	38	302	13	0	0	0	858	38	25	0	25	9	9	4	0	0	0	0	0	91	4	858	38
Cat 202a-923	Off-site via on-site storm system and Stormtech	59.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	59	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	51	302	18	0	0	0	858	51	33	0	33	13	13	5	0	0	0	0	0	91	5	858	51
Cat 202a-924	Off-site via on-site storm system and Stormtech	401.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	401	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	344	302	121	0	0	0	858	344	223	0	223	85	85	36	0	0	0	0	0	91	36	858	344
Cat 202a-925	Off-site via on-site storm system and Stormtech	58.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	58	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	50	302	18	0	0	0	858	50	32	0	32	12	12	5	0	0	0	0	0	91	5	858	50
Cat 202a-926	Off-site via on-site storm system and Stormtech	159.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	160	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	137	302	48	0	0	0	858	137	89	0	89	34	34	14	0	0	0	0	0	91	14	858	137
Cat 202a-927	Off-site via on-site storm system and Stormtech	6.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	7	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	6	302	2	0	0	0	858	6	4	0	4	1	1	1	0	0	0	0	0	91	1	858	6
Cat 202a-928	Off-site via on-site storm system and Stormtech	707.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	708	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	607	302	214	0	0	0	858	607	393	0	393	150	150	64	0	0	0	0	0	91	64	858	607
Cat 202a-929	Off-site via on-site storm system and Stormtech	9.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	9	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	8	302	3	0	0	0	858	8	5	0	5	2	2	1	0	0	0	0	0	91	1	858	8
Cat 202a-930	Off-site via on-site storm system and Stormtech	11.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	12	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	10	302	4	0	0	0	858	10	7	0	7	3	3	1	0	0	0	0	0	91	1	858	10
Cat 202a-931	Off-site via on-site storm system and Stormtech	14.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	15	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	12	302	4	0	0	0	858	12	8	0	8	3	3	1	0	0	0	0	0	91	1	858	12
Cat 202a-932	Off-site via on-site storm system and Stormtech	29.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	29	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	25	302	9	0	0	0	858	25	16	0	16	6	6	3	0	0	0	0	0	91	3	858	25
Cat 202a-933	Off-site via on-site storm system and Stormtech	104.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	105	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	90	302	32	0	0	0	858	90	58	0	58	22	22	10	0	0	0	0	0	91	10	858	90
Cat 202a-934	Off-site via on-site storm system and Stormtech	398.1	100%	398.1	0%	0.0	100%	398.1	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	341	0	0	772	307	0	858	341	0	34	34	0	0	0	0	0	307	0	772	307	772	307	858	341
Cat 202a-935	Off-site via on-site storm system and Stormtech	72.2	100%	72.2	0%	0.0	100%	72.2	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	62	0	0	772	56	0	858	62	0	6	6	0	0	0	0	0	56	0	772	56	772	56	858	62
Cat 202a-936	Off-site via on-site storm system and Stormtech	8.4	100%	8.4	0%	0.0	100%	8.4	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	7	0	0	772	6	0	858	7	0	1	1	0	0	0	0	0	6	0	772	6	772	6	858	7
Post-Development Catchment 202a Total		**19,301**	**67%**	**12,935**	**32%**	**6,168**	**35%**	**6,767**	**0**	**33%**	**6,366**								**858**	**16,555**	**99**	**1,908**	**517**	**9,985**	**0**	**858**	**16,555**	**3,552**	**1,109**	**4,661**	**1,336**	**1,336**	**572**	**0**	**4,761**	**5,224**	**0**	**517**	**9,985**	**547**	**10,558**	**858**	**16,555**
Cat 202b-6	Off-site via on-site storm system and Stormtech	23.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	24	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	20	302	7	0	0	0	858	20	13	0	13	5	5	2	0	0	0	0	0	91	2	858	20
Cat 202b-90	Off-site via on-site storm system and Stormtech	97.0	100%	97.0	0%	0.0	100%	97.0	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	83	0	0	772	75	0	858	83	0	8	8	0	0	0	0	0	75	0	772	75	772	75	858	83
Cat 202b-91	Off-site via on-site storm system and Stormtech	38.4	80%	30.7	0%	0.0	100%	30.7	0.0	20%	8	Concrete

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious							Pervious		MOE TABLE 2 Components						MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious	Total Pervious										Precipitation						Run-on	Total Inputs	Evapotranspiration			Infiltration		Pervious	Landscaped Area Redirected	Building	Road/ Driveway/ Amenities	Runoff Other Impervious	Total Impervious		Total Runoff		Total Outputs	
																				Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration										
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography				(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Post-Development Catchment 202 Total Adjusted (Bioswale)		**23,580**	**60%**	**14,158**	**31%**	**7,222**	**29%**	**6,937**	**0**	**40%**	**9,422**									**858**	**20,225**	**120**	**2,828**	**463**	**10,929**	**0**	**858**	**20,225**	**5,252**	**1,214**	**6,467**	**1,980**	**2,682**	**849**	**0**	**5,575**	**5,355**	**0**	**463**	**10,929**	**470**	**11,076**	**858**	**20,225**
Post-Development Catchment 202 Total Adjusted (Bioswale + Stormtech)		**23,580**	**60%**	**14,158**	**31%**	**7,222**	**29%**	**6,937**	**0**	**40%**	**9,422**									**858**	**20,225**	**120**	**2,828**	**463**	**10,929**	**0**	**858**	**20,225**	**5,252**	**1,214**	**6,467**	**1,980**	**11,543**	**849**	**0**	**5,575**	**5,355**	**0**	**463**	**10,929**	**94**	**2,215**	**858**	**20,225**
Cat 203-339	Off-site via storm sewer system to Stormtech LID	57.3	100%	57.3	100%	57.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	49	0	0	772	44	0	858	49	0	5	5	0	0	0	0	44	0	0	772	44	772	44	858	49
Cat 203-340	Off-site via storm sewer system to Stormtech LID	43.7	100%	43.7	100%	43.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	37	0	0	772	34	0	858	37	0	4	4	0	0	0	0	34	0	0	772	34	772	34	858	37
Cat 203-341	Off-site via storm sewer system to Stormtech LID	43.2	100%	43.2	100%	43.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	37	0	0	772	33	0	858	37	0	4	4	0	0	0	0	33	0	0	772	33	772	33	858	37
Cat 203-342	Off-site via storm sewer system to Stormtech LID	29.9	100%	29.9	100%	29.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	26	0	0	772	23	0	858	26	0	3	3	0	0	0	0	23	0	0	772	23	772	23	858	26
Cat 203-343	Off-site via storm sewer system to Stormtech LID	13.4	100%	13.4	100%	13.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	11	0	0	772	10	0	858	11	0	1	1	0	0	0	0	10	0	0	772	10	772	10	858	11
Cat 203-344	Off-site via storm sewer system to Stormtech LID	35.1	100%	35.1	100%	35.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	30	0	0	772	27	0	858	30	0	3	3	0	0	0	0	27	0	0	772	27	772	27	858	30
Cat 203-345	Off-site via storm sewer system to Stormtech LID	22.6	100%	22.6	100%	22.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	19	0	0	772	17	0	858	19	0	2	2	0	0	0	0	17	0	0	772	17	772	17	858	19
Cat 203-346	Off-site via storm sewer system to Stormtech LID	30.1	100%	30.1	100%	30.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	26	0	0	772	23	0	858	26	0	3	3	0	0	0	0	23	0	0	772	23	772	23	858	26
Cat 203-347	Off-site via storm sewer system to Stormtech LID	22.4	100%	22.4	100%	22.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	19	0	0	772	17	0	858	19	0	2	2	0	0	0	0	17	0	0	772	17	772	17	858	19
Cat 203-348	Off-site via storm sewer system to Stormtech LID	14.7	100%	14.7	100%	14.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	13	0	0	772	11	0	858	13	0	1	1	0	0	0	0	11	0	0	772	11	772	11	858	13
Cat 203-349	Off-site via storm sewer system to Stormtech LID	9.4	100%	9.4	100%	9.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	7	0	0	772	7	772	7	858	8
Cat 203-350	Off-site via storm sewer system to Stormtech LID	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 203-351	Off-site via storm sewer system to Stormtech LID	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 203-352	Off-site via storm sewer system to Stormtech LID	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 203-353	Off-site via storm sewer system to Stormtech LID	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 203-354	Off-site via storm sewer system to Stormtech LID	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 203-355	Off-site via storm sewer system to Stormtech LID	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 203-356	Off-site via storm sewer system to Stormtech LID	4.2	100%	4.2	100%	4.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	4	0	0	772	3	0	858	4	0	0	0	0	0	0	0	3	0	0	772	3	772	3	858	4
Cat 203-357	Off-site via storm sewer system to Stormtech LID	81.1	100%	81.1	100%	81.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	70	0	0	772	63	0	858	70	0	7	7	0	0	0	0	63	0	0	772	63	772	63	858	70
Cat 203-358	Off-site via storm sewer system to Stormtech LID	137.2	100%	137.2	100%	137.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	118	0	0	772	106	0	858	118	0	12	12	0	0	0	0	106	0	0	772	106	772	106	858	118
Cat 203-359	Off-site via storm sewer system to Stormtech LID	136.9	100%	136.9	100%	136.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	117	0	0	772	106	0	858	117	0	12	12	0	0	0	0	106	0	0	772	106	772	106	858	117
Cat 203-360	Off-site via storm sewer system to Stormtech LID	138.7	100%	138.7	100%	138.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	119	0	0	772	107	0	858	119	0	12	12	0	0	0	0	107	0	0	772	107	772	107	858	119
Cat 203-361	Off-site via storm sewer system to Stormtech LID	130.6	100%	130.6	100%	130.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0		858	112	0	0	772	101	0	858	112	0	11	11	0	0	0	0	101	0	0	772	101	772	101	858	112
Cat 203-362	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-363	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-364	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-365	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-366	Off-site via storm sewer system to Stormtech LID	7.9	100%	7.9	0%	0.0	100%	7.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	7	0	0	772	6	0	858	7	0	1	1	0	0	0	0	0	6	0	772	6	772	6	858	7
Cat 203-367	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-368	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-369	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-370	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-371	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-372	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-373	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-374	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-375	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-376	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-377	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-378	Off-site via storm sewer system to Stormtech LID	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0		858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 203-379	Off-site via storm sewer system to Stormtech LID	46.6	100%	46.6	0%	0.0	100%	46.6	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	40
Cat 203-380	Off-site via storm sewer system to Stormtech LID	45.4	100%	45.4	0%	0.0	100%	45.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	35	0	0	772	35	772	35	858	39
Cat 203-381	Off-site via storm sewer system to Stormtech LID	47.1	100%	47.1	0%	0.0	100%	47.1	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	40
Cat 203-382	Off-site via storm sewer system to Stormtech LID	47.4	100%	47.4	0%	0.0	100%	47.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 203-383	Off-site via storm sewer system to Stormtech LID	51.6	100%	51.6	0%	0.0	100%	51.6	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	44	0	0	772	40	0	858	44	0	4	4	0	0	0	0	40	0	0	772	40	772	40	858	44
Cat 203-384	Off-site via storm sewer system to Stormtech LID	51.7	100%	51.7	0%	0.0	100%	51.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	44	0	0	772	40	0	858	44	0	4	4	0	0	0	0	40	0	0	772	40	772	40	858	44
Cat 203-385	Off-site via storm sewer system to Stormtech LID	47.3	100%	47.3	0%	0.0	100%	47.3	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	41	0	0	772	36	0	858	41	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	41
Cat 203-386	Off-site via storm sewer system to Stormtech LID	47.2	100%	47.2	0%	0.0	100%	47.2	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	40
Cat 203-387	Off-site via storm sewer system to Stormtech LID	51.8	100%	51.8	0%	0.0	100%	51.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	44	0	0	772	40	0	858	44	0	4	4	0	0	0	0	40	0	0	772	40	772	40	858	44
Cat 203-388	Off-site via storm sewer system to Stormtech LID	46.5	100%	46.5	0%	0.0	100%	46.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	40
Cat 203-389	Off-site via storm sewer system to Stormtech LID	54.5	100%	54.5	0%	0.0	100%	54.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	47	0	0	772	42	0	858	47	0	5	5	0	0	0	0	42	0	0	772	42	772	42	858	47
Cat 203-390	Off-site via storm sewer system to Stormtech LID	45.8	100%	45.8	0%	0.0	100%	45.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	35	0	0	772	35	772	35	858	39
Cat 203-391	Off-site via storm sewer system to Stormtech LID	37.3	100%	37.3	0%	0.0	100%	37.3	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	32	0	0	772	29	0	858	32	0	3	3	0	0	0	0	29	0	0	772	29	772	29	858	32
Cat 203-392	Off-site via storm sewer system to Stormtech LID	40.4	100%	40.4	0%	0.0	100%	40.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	35	0	0	772	31	0	858	35	0	3	3	0	0	0	0	31	0	0	772	31	772	31	858	35
Cat 203-393	Off-site via storm sewer system to Stormtech LID	47.0	100%	47.0	0%	0.0	100%	47.0	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	40
Cat 203-394	Off-site via storm sewer system to Stormtech LID	47.6	100%	47.6	0%	0.0	100%	47.6	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 203-395	Off-site via storm sewer system to Stormtech LID	69.8	100%	69.8	0%	0.0	100%	69.8	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0		858	60	0	0	772	54	0	858	60	0	6	6	0	0	0	0	54	0	0	772	54	772	54	858	60
Cat 203-396	Off-site via storm sewer system to Stormtech LID	1359.7	100%	1359.7	0%	0.0	100%	1359.7	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0		858	1,166	0	0	772	1,050	0	858	1,166	0	117	117	0	0	0	0	1,050	0	772	1,050	772	1,050	858	1,166
Cat 203-628	Off-site via storm sewer system to Stormtech LID	164.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	164	awns Stormtec	0.05	Silt Loam	0.4	0.25	0.7	0.7		858	141	302	50	0	0	0	858	141	91	0	91	35	35	15	0	0	0	0	0	91	15	858	141
Cat 203-630	Off-site via storm sewer system to Stormtech LID	66.1	80%	52.9	0%	0.0	100%	52.9	0.0	20%	13	Walkway	0	Silt Loam	0.4	0.25	0.65	0		858	57	0	0	772	41	0	858	57	11	5	16	0	0	0	0	41	0	618	41	618	41	858	57
Cat 203-634	Off-site via storm sewer system to Stormtech LID	12.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	12	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7		858	11	302	4	0	0	0	858	11	7	0	7	3	3	1	0	0	0	0	0	91	1	858	11
Cat 203-830	Off-site via storm sewer system to Stormtech LID	82.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	82	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7		858	70	302	25	0	0	0	858	70	46	0	46	17	17	7	0	0	0	0	0	91	7	858	70
Cat 203-831	Off-site via storm sewer system to Stormtech LID	3.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	4	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7		858	3	302	1	0	0	0	858	3	2	0	2	1	1	0	0	0	0	0	0	91	0	858	3
Cat 203-832	Off-site via storm sewer system to Stormtech LID	107.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	108	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7		858	92	302	32	0	0	0	858	92	60	0	60	23	23	10	0	0	0	0	0	91	10	858	92
Cat 203-833	Off-site via storm sewer system to Stormtech LID	47.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	47	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7		858	40	302	14	0	0	0	858	40	26	0	26	10	10	4	0	0	0	0	0	91	4	858	40
Cat 203-834	Off-site via storm sewer system to Stormtech LID	30.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	31	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7		858	26	302	9	0	0	0	858	26	17	0	17	7	7	3	0	0	0

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

			Impervious							Pervious		MOE TABLE 2 Components							Inputs												Outputs													
																			Precipitation								Evapotranspiration			Infiltration													
		Total Area	Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious	Total Pervious					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Annual Average		Surplus (Pervious)		Surplus (Impervious)		Run-on	Total Inputs		Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirected	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff		Total Outputs	
On-Site Subcatchment Designation	Outlet	(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover	Soil	Topography			(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 204a-405	Off-site via stormsewer system/Stormtech LID 4	58.8	100%	58.8	100%	58.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	50	0	0	772	45	0	858	50	0	5	5	0	0	0	0	45	0	0	772	45	772	45	858	50
Cat 204a-406	Off-site via stormsewer system/Stormtech LID 4	96.1	100%	96.1	100%	96.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	82	0	0	772	74	0	858	82	0	8	8	0	0	0	0	74	0	0	772	74	772	74	858	82
Cat 204a-407	Off-site via stormsewer system/Stormtech LID 4	2.2	100%	2.2	100%	2.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	2	0	0	772	2	0	858	2	0	0	0	0	0	0	0	2	0	0	772	2	772	2	858	2
Cat 204a-408	Off-site via stormsewer system/Stormtech LID 4	18.7	100%	18.7	100%	18.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	16	0	0	772	14	0	858	16	0	2	2	0	0	0	0	14	0	0	772	14	772	14	858	16
Cat 204a-409	Off-site via stormsewer system/Stormtech LID 4	5.6	100%	5.6	100%	5.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	5	0	0	772	4	0	858	5	0	0	0	0	0	0	0	4	0	0	772	4	772	4	858	5
Cat 204a-410	Off-site via stormsewer system/Stormtech LID 4	11.2	100%	11.2	100%	11.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	10	0	0	772	9	0	858	10	0	1	1	0	0	0	0	9	0	0	772	9	772	9	858	10
Cat 204a-411	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-412	Off-site via stormsewer system/Stormtech LID 4	10.6	100%	10.6	100%	10.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	8	0	0	772	8	772	8	858	9
Cat 204a-413	Off-site via stormsewer system/Stormtech LID 4	2.0	100%	2.0	100%	2.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	2	0	0	772	2	0	858	2	0	0	0	0	0	0	0	2	0	0	772	2	772	2	858	2
Cat 204a-414	Off-site via stormsewer system/Stormtech LID 4	1.8	100%	1.8	100%	1.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	2	0	0	772	1	0	858	2	0	0	0	0	0	0	0	1	0	0	772	1	772	1	858	2
Cat 204a-415	Off-site via stormsewer system/Stormtech LID 4	38.4	100%	38.4	100%	38.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	33	0	0	772	30	0	858	33	0	3	3	0	0	0	0	30	0	0	772	30	772	30	858	33
Cat 204a-416	Off-site via stormsewer system/Stormtech LID 4	47.5	100%	47.5	100%	47.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	37	0	0	772	37	772	37	858	41
Cat 204a-417	Off-site via stormsewer system/Stormtech LID 4	45.2	100%	45.2	100%	45.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	35	0	0	772	35	772	35	858	39
Cat 204a-418	Off-site via stormsewer system/Stormtech LID 4	51.1	100%	51.1	100%	51.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	44	0	0	772	39	0	858	44	0	4	4	0	0	0	0	39	0	0	772	39	772	39	858	44
Cat 204a-419	Off-site via stormsewer system/Stormtech LID 4	49.3	100%	49.3	100%	49.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	42	0	0	772	38	0	858	42	0	4	4	0	0	0	0	38	0	0	772	38	772	38	858	42
Cat 204a-420	Off-site via stormsewer system/Stormtech LID 4	46.2	100%	46.2	100%	46.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	36	0	0	772	36	772	36	858	40
Cat 204a-421	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-422	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-423	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-424	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-425	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-426	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-427	Off-site via stormsewer system/Stormtech LID 4	49.9	100%	49.9	100%	49.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	43	0	0	772	39	0	858	43	0	4	4	0	0	0	0	39	0	0	772	39	772	39	858	43
Cat 204a-428	Off-site via stormsewer system/Stormtech LID 4	70.3	100%	70.3	100%	70.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	60	0	0	772	54	0	858	60	0	6	6	0	0	0	0	54	0	0	772	54	772	54	858	60
Cat 204a-429	Off-site via stormsewer system/Stormtech LID 4	100.6	100%	100.6	100%	100.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	86	0	0	772	78	0	858	86	0	9	9	0	0	0	0	78	0	0	772	78	772	78	858	86
Cat 204a-430	Off-site via stormsewer system/Stormtech LID 4	126.2	100%	126.2	100%	126.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	108	0	0	772	97	0	858	108	0	11	11	0	0	0	0	97	0	0	772	97	772	97	858	108
Cat 204a-431	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-432	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-433	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-434	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-435	Off-site via stormsewer system/Stormtech LID 4	162.0	100%	162.0	100%	162.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	139	0	0	772	125	0	858	139	0	14	14	0	0	0	0	125	0	0	772	125	772	125	858	139
Cat 204a-436	Off-site via stormsewer system/Stormtech LID 4	139.4	100%	139.4	100%	139.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	120	0	0	772	108	0	858	120	0	12	12	0	0	0	0	108	0	0	772	108	772	108	858	120
Cat 204a-437	Off-site via stormsewer system/Stormtech LID 4	44.3	100%	44.3	100%	44.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	34	0	858	38	0	4	4	0	0	0	0	34	0	0	772	34	772	34	858	38
Cat 204a-438	Off-site via stormsewer system/Stormtech LID 4	4.8	100%	4.8	100%	4.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	4	0	0	772	4	0	858	4	0	0	0	0	0	0	0	4	0	0	772	4	772	4	858	4
Cat 204a-439	Off-site via stormsewer system/Stormtech LID 4	3.0	100%	3.0	100%	3.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	3	0	0	772	2	0	858	3	0	0	0	0	0	0	0	2	0	0	772	2	772	2	858	3
Cat 204a-440	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-441	Off-site via stormsewer system/Stormtech LID 4	73.7	100%	73.7	100%	73.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	63	0	0	772	57	0	858	63	0	6	6	0	0	0	0	57	0	0	772	57	772	57	858	63
Cat 204a-442	Off-site via stormsewer system/Stormtech LID 4	77.1	100%	77.1	100%	77.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	66	0	0	772	60	0	858	66	0	7	7	0	0	0	0	60	0	0	772	60	772	60	858	66
Cat 204a-443	Off-site via stormsewer system/Stormtech LID 4	79.2	100%	79.2	100%	79.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	68	0	0	772	61	0	858	68	0	7	7	0	0	0	0	61	0	0	772	61	772	61	858	68
Cat 204a-444	Off-site via stormsewer system/Stormtech LID 4	80.7	100%	80.7	100%	80.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	69	0	0	772	62	0	858	69	0	7	7	0	0	0	0	62	0	0	772	62	772	62	858	69
Cat 204a-445	Off-site via stormsewer system/Stormtech LID 4	78.7	100%	78.7	100%	78.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	67	0	0	772	61	0	858	67	0	7	7	0	0	0	0	61	0	0	772	61	772	61	858	67
Cat 204a-446	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-447	Off-site via stormsewer system/Stormtech LID 4	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 204a-448	Off-site via stormsewer system/Stormtech LID 4	294.2	100%	294.2	100%	294.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	252	0	0	772	227	0	858	252	0	25	25	0	0	0	0	227	0	0	772	227	772	227	858	252
Cat 204a-449	Off-site via stormsewer system/Stormtech LID 4	217.3	100%	217.3	100%	217.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	186	0	0	772	168	0	858	186	0	19	19	0	0	0	0	168	0	0	772	168	772	168	858	186
Cat 204a-450	Off-site via stormsewer system/Stormtech LID 4	161.2	100%	161.2	100%	161.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	138	0	0	772	124	0	858	138	0	14	14	0	0	0	0	124	0	0	772	124	772	124	858	138
Cat 204a-451	Off-site via stormsewer system/Stormtech LID 4	161.5	100%	161.5	100%	161.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	139	0	0	772	125	0	858	139	0	14	14	0	0	0	0	125	0	0	772	125	772	125	858	139
Cat 204a-452	Off-site via stormsewer system/Stormtech LID 4	159.7	100%	159.7	100%	159.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	137	0	0	772	123	0	858	137	0	14	14	0	0	0	0	123	0	0	772	123	772	123	858	137
Cat 204a-453	Off-site via stormsewer system/Stormtech LID 4	167.8	100%	167.8	100%	167.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	144	0	0	772	130	0	858	144	0	14	14	0	0	0	0	130	0	0	772	130	772	130	858	144
Cat 204a-454	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-455	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-456	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-457	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-458	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-459	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-460	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-461	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-462	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-463	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-464	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-465	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-466	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-467	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-468	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-469	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-470	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-471	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-472	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious		Total Pervious							Precipitation						Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff						Total Outputs
																		Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirected	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff			
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)		% of Total Area	(m^2)	Cover		Soil		Topography																					
																		(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 204a-499	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-500	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-501	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-502	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-503	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-504	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-505	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-506	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-507	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-508	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-509	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-510	Off-site via stormsewer system/Stormtech LID 4	10.9	100%	10.9	0%	0.0	100%	10.9	0.0		0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 204a-511	Off-site via stormsewer system/Stormtech LID 4	52.8	100%	52.8	0%	0.0	100%	52.8	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	45	0	0	772	41	0	858	45	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	45
Cat 204a-512	Off-site via stormsewer system/Stormtech LID 4	44.0	100%	44.0	0%	0.0	100%	44.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	34	0	858	38	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	38
Cat 204a-513	Off-site via stormsewer system/Stormtech LID 4	45.5	100%	45.5	0%	0.0	100%	45.5	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	39
Cat 204a-514	Off-site via stormsewer system/Stormtech LID 4	53.4	100%	53.4	0%	0.0	100%	53.4	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	46	0	0	772	41	0	858	46	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	46
Cat 204a-515	Off-site via stormsewer system/Stormtech LID 4	52.0	100%	52.0	0%	0.0	100%	52.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	45	0	0	772	40	0	858	45	0	4	4	0	0	0	0	0	40	0	772	40	772	40	858	45
Cat 204a-516	Off-site via stormsewer system/Stormtech LID 4	49.3	100%	49.3	0%	0.0	100%	49.3	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	42	0	0	772	38	0	858	42	0	4	4	0	0	0	0	0	38	0	772	38	772	38	858	42
Cat 204a-517	Off-site via stormsewer system/Stormtech LID 4	45.4	100%	45.4	0%	0.0	100%	45.4	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	39
Cat 204a-518	Off-site via stormsewer system/Stormtech LID 4	46.9	100%	46.9	0%	0.0	100%	46.9	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	40
Cat 204a-519	Off-site via stormsewer system/Stormtech LID 4	48.1	100%	48.1	0%	0.0	100%	48.1	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	41	0	0	772	37	0	858	41	0	4	4	0	0	0	0	0	37	0	772	37	772	37	858	41
Cat 204a-520	Off-site via stormsewer system/Stormtech LID 4	45.7	100%	45.7	0%	0.0	100%	45.7	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	39
Cat 204a-521	Off-site via stormsewer system/Stormtech LID 4	44.8	100%	44.8	0%	0.0	100%	44.8	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	35	0	858	38	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	38
Cat 204a-522	Off-site via stormsewer system/Stormtech LID 4	45.6	100%	45.6	0%	0.0	100%	45.6	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	39
Cat 204a-523	Off-site via stormsewer system/Stormtech LID 4	46.7	100%	46.7	0%	0.0	100%	46.7	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	40
Cat 204a-524	Off-site via stormsewer system/Stormtech LID 4	45.4	100%	45.4	0%	0.0	100%	45.4	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	39
Cat 204a-525	Off-site via stormsewer system/Stormtech LID 4	56.2	100%	56.2	0%	0.0	100%	56.2	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	48	0	0	772	43	0	858	48	0	5	5	0	0	0	0	0	43	0	772	43	772	43	858	48
Cat 204a-526	Off-site via stormsewer system/Stormtech LID 4	46.5	100%	46.5	0%	0.0	100%	46.5	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	40
Cat 204a-527	Off-site via stormsewer system/Stormtech LID 4	46.0	100%	46.0	0%	0.0	100%	46.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	36	0	858	39	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	39
Cat 204a-528	Off-site via stormsewer system/Stormtech LID 4	46.3	100%	46.3	0%	0.0	100%	46.3	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	40	0	0	772	36	0	858	40	0	4	4	0	0	0	0	0	36	0	772	36	772	36	858	40
Cat 204a-529	Off-site via stormsewer system/Stormtech LID 4	37.5	100%	37.5	0%	0.0	100%	37.5	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	32	0	0	772	29	0	858	32	0	3	3	0	0	0	0	0	29	0	772	29	772	29	858	32
Cat 204a-530	Off-site via stormsewer system/Stormtech LID 4	43.6	100%	43.6	0%	0.0	100%	43.6	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	37	0	0	772	34	0	858	37	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	37
Cat 204a-531	Off-site via stormsewer system/Stormtech LID 4	43.8	100%	43.8	0%	0.0	100%	43.8	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	34	0	858	38	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	38
Cat 204a-532	Off-site via stormsewer system/Stormtech LID 4	40.6	100%	40.6	0%	0.0	100%	40.6	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	35	0	0	772	31	0	858	35	0	3	3	0	0	0	0	0	31	0	772	31	772	31	858	35
Cat 204a-533	Off-site via stormsewer system/Stormtech LID 4	41.6	100%	41.6	0%	0.0	100%	41.6	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	36	0	0	772	32	0	858	36	0	4	4	0	0	0	0	0	32	0	772	32	772	32	858	36
Cat 204a-534	Off-site via stormsewer system/Stormtech LID 4	52.9	100%	52.9	0%	0.0	100%	52.9	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	45	0	0	772	41	0	858	45	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	45
Cat 204a-535	Off-site via stormsewer system/Stormtech LID 4	51.8	100%	51.8	0%	0.0	100%	51.8	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	44	0	0	772	40	0	858	44	0	4	4	0	0	0	0	0	40	0	772	40	772	40	858	44
Cat 204a-536	Off-site via stormsewer system/Stormtech LID 4	44.8	100%	44.8	0%	0.0	100%	44.8	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	35	0	858	38	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	38
Cat 204a-537	Off-site via stormsewer system/Stormtech LID 4	44.7	100%	44.7	0%	0.0	100%	44.7	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	34	0	858	38	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	38
Cat 204a-538	Off-site via stormsewer system/Stormtech LID 4	44.0	100%	44.0	0%	0.0	100%	44.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	38	0	0	772	34	0	858	38	0	4	4	0	0	0	0	0	34	0	772	34	772	34	858	38
Cat 204a-539	Off-site via stormsewer system/Stormtech LID 4	54.3	100%	54.3	0%	0.0	100%	54.3	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	47	0	0	772	42	0	858	47	0	5	5	0	0	0	0	0	42	0	772	42	772	42	858	47
Cat 204a-540	Off-site via stormsewer system/Stormtech LID 4	56.3	100%	56.3	0%	0.0	100%	56.3	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	48	0	0	772	43	0	858	48	0	5	5	0	0	0	0	0	43	0	772	43	772	43	858	48
Cat 204a-541	Off-site via stormsewer system/Stormtech LID 4	41.4	100%	41.4	0%	0.0	100%	41.4	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	36	0	0	772	32	0	858	36	0	4	4	0	0	0	0	0	32	0	772	32	772	32	858	36
Cat 204a-542	Off-site via stormsewer system/Stormtech LID 4	43.0	100%	43.0	0%	0.0	100%	43.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	37	0	0	772	33	0	858	37	0	4	4	0	0	0	0	0	33	0	772	33	772	33	858	37
Cat 204a-543	Off-site via stormsewer system/Stormtech LID 4	41.1	100%	41.1	0%	0.0	100%	41.1	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	35	0	0	772	32	0	858	35	0	4	4	0	0	0	0	0	32	0	772	32	772	32	858	35
Cat 204a-544	Off-site via stormsewer system/Stormtech LID 4	53.9	100%	53.9	0%	0.0	100%	53.9	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	46	0	0	772	42	0	858	46	0	5	5	0	0	0	0	0	42	0	772	42	772	42	858	46
Cat 204a-545	Off-site via stormsewer system/Stormtech LID 4	53.7	100%	53.7	0%	0.0	100%	53.7	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	46	0	0	772	41	0	858	46	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	46
Cat 204a-546	Off-site via stormsewer system/Stormtech LID 4	56.1	100%	56.1	0%	0.0	100%	56.1	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	48	0	0	772	43	0	858	48	0	5	5	0	0	0	0	0	43	0	772	43	772	43	858	48
Cat 204a-547	Off-site via stormsewer system/Stormtech LID 4	53.2	100%	53.2	0%	0.0	100%	53.2	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	46	0	0	772	41	0	858	46	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	46
Cat 204a-548	Off-site via stormsewer system/Stormtech LID 4	40.6	100%	40.6	0%	0.0	100%	40.6	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	35	0	0	772	31	0	858	35	0	3	3	0	0	0	0	0	31	0	772	31	772	31	858	35
Cat 204a-549	Off-site via stormsewer system/Stormtech LID 4	41.0	100%	41.0	0%	0.0	100%	41.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	35	0	0	772	32	0	858	35	0	4	4	0	0	0	0	0	32	0	772	32	772	32	858	35
Cat 204a-550	Off-site via stormsewer system/Stormtech LID 4	42.9	100%	42.9	0%	0.0	100%	42.9	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	37	0	0	772	33	0	858	37	0	4	4	0	0	0	0	0	33	0	772	33	772	33	858	37
Cat 204a-551	Off-site via stormsewer system/Stormtech LID 4	41.1	100%	41.1	0%	0.0	100%	41.1	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	35	0	0	772	32	0	858	35	0	4	4	0	0	0	0	0	32	0	772	32	772	32	858	35
Cat 204a-552	Off-site via stormsewer system/Stormtech LID 4	50.5	100%	50.5	0%	0.0	100%	50.5	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	43	0	0	772	39	0	858	43	0	4	4	0	0	0	0	0	39	0	772	39	772	39	858	43
Cat 204a-553	Off-site via stormsewer system/Stormtech LID 4	52.7	100%	52.7	0%	0.0	100%	52.7	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	45	0	0	772	41	0	858	45	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	45
Cat 204a-554	Off-site via stormsewer system/Stormtech LID 4	54.5	100%	54.5	0%	0.0	100%	54.5	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	47	0	0	772	42	0	858	47	0	5	5	0	0	0	0	0	42	0	772	42	772	42	858	47
Cat 204a-555	Off-site via stormsewer system/Stormtech LID 4	55.0	100%	55.0	0%	0.0	100%	55.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	47	0	0	772	42	0	858	47	0	5	5	0	0	0	0	0	42	0	772	42	772	42	858	47
Cat 204a-556	Off-site via stormsewer system/Stormtech LID 4	54.3	100%	54.3	0%	0.0	100%	54.3	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	47	0	0	772	42	0	858	47	0	5	5	0	0	0	0	0	42	0	772	42	772	42	858	47
Cat 204a-557	Off-site via stormsewer system/Stormtech LID 4	50.2	100%	50.2	0%	0.0	100%	50.2	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	43	0	0	772	39	0	858	43	0	4	4	0	0	0	0	0	39	0	772	39	772	39	858	43
Cat 204a-558	Off-site via stormsewer system/Stormtech LID 4	37.0	100%	37.0	0%	0.0	100%	37.0	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	32	0	0	772	29	0	858	32	0	3	3	0	0	0	0	0	29	0	772	29	772	29	858	32
Cat 204a-559	Off-site via stormsewer system/Stormtech LID 4	36.6	100%	36.6	0%	0.0	100%	36.6	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	31	0	0	772	28	0	858	31	0	3	3	0	0	0	0	0	28	0	772	28	772	28	858	31
Cat 204a-560	Off-site via stormsewer system/Stormtech LID 4	52.7	100%	52.7	0%	0.0	100%	52.7	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	45	0	0	772	41	0	858	45	0	5	5	0	0	0	0	0	41	0	772	41	772	41	858	45
Cat 204a-561	Off-site via stormsewer system/Stormtech LID 4	45.5	100%	45.5	0%	0.0	100%	45.5	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	39	0	0	772	35	0	858	39	0	4	4	0	0	0	0	0	35	0	772	35	772	35	858	39
Cat 204a-562	Off-site via stormsewer system/Stormtech LID 4	63.9	100%	63.9	0%	0.0	100%	63.9	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	55	0	0	772	49	0	858	55	0	5	5	0	0	0	0	0	49	0	772	49	772	49	858	55
Cat 204a-563	Off-site via stormsewer system/Stormtech LID 4	36.9	100%	36.9	0%	0.0	100%	36.9	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	32	0	0	772	28	0	858	32	0	3	3	0	0	0	0	0	28	0	772	28	772	28	858	32
Cat 204a-564	Off-site via stormsewer system/Stormtech LID 4	54.2	100%	54.2	0%	0.0	100%	54.2	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	46	0	0	772	42	0	858	46	0	5	5	0	0	0	0	0	42	0	772	42	772	42	858	46
Cat 204a-565	Off-site via stormsewer system/Stormtech LID 4	52.9	100%	52.9	0%	0.0	100%	52.9	0.0		0%	0	Driveway	0	Silt Loam	0.4	0.25

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components						MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious	Total Pervious									Precipitation						Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff						Total Outputs
																			Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirected	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff			
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography			(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 204a-860	Off-site via stormsewer system/Stormtech LID 4	65.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	65	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	56	302	20	0	0	0	858	56	36	0	36	14	14	6	0	0	0	0	0	91	6	858	56
Cat 204a-861	Off-site via stormsewer system/Stormtech LID 4	11.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	11	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	9	302	3	0	0	0	858	9	6	0	6	2	2	1	0	0	0	0	0	91	1	858	9
Cat 204a-862	Off-site via stormsewer system/Stormtech LID 4	51.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	51	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	44	302	15	0	0	0	858	44	28	0	28	11	11	5	0	0	0	0	0	91	5	858	44
Cat 204a-863	Off-site via stormsewer system/Stormtech LID 4	61.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	61	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	53	302	19	0	0	0	858	53	34	0	34	13	13	6	0	0	0	0	0	91	6	858	53
Cat 204a-864	Off-site via stormsewer system/Stormtech LID 4	53.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	53	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	46	302	16	0	0	0	858	46	30	0	30	11	11	5	0	0	0	0	0	91	5	858	46
Cat 204a-865	Off-site via stormsewer system/Stormtech LID 4	66.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	66	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	57	302	20	0	0	0	858	57	37	0	37	14	14	6	0	0	0	0	0	91	6	858	57
Cat 204a-866	Off-site via stormsewer system/Stormtech LID 4	46.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	46	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	40	302	14	0	0	0	858	40	26	0	26	10	10	4	0	0	0	0	0	91	4	858	40
Cat 204a-867	Off-site via stormsewer system/Stormtech LID 4	69.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	69	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	59	302	21	0	0	0	858	59	38	0	38	15	15	6	0	0	0	0	0	91	6	858	59
Cat 204a-868	Off-site via stormsewer system/Stormtech LID 4	55.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	55	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	47	302	17	0	0	0	858	47	31	0	31	12	12	5	0	0	0	0	0	91	5	858	47
Cat 204a-869	Off-site via stormsewer system/Stormtech LID 4	58.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	58	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	50	302	18	0	0	0	858	50	33	0	33	12	12	5	0	0	0	0	0	91	5	858	50
Cat 204a-870	Off-site via stormsewer system/Stormtech LID 4	50.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	51	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	44	302	15	0	0	0	858	44	28	0	28	11	11	5	0	0	0	0	0	91	5	858	44
Cat 204a-871	Off-site via stormsewer system/Stormtech LID 4	65.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	65	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	56	302	20	0	0	0	858	56	36	0	36	14	14	6	0	0	0	0	0	91	6	858	56
Cat 204a-872	Off-site via stormsewer system/Stormtech LID 4	53.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	54	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	46	302	16	0	0	0	858	46	30	0	30	11	11	5	0	0	0	0	0	91	5	858	46
Cat 204a-873	Off-site via stormsewer system/Stormtech LID 4	69.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	70	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	60	302	21	0	0	0	858	60	39	0	39	15	15	6	0	0	0	0	0	91	6	858	60
Cat 204a-874	Off-site via stormsewer system/Stormtech LID 4	125.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	125	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	107	302	38	0	0	0	858	107	70	0	70	26	26	11	0	0	0	0	0	91	11	858	107
Cat 204a-875	Off-site via stormsewer system/Stormtech LID 4	72.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	72	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	62	302	22	0	0	0	858	62	40	0	40	15	15	7	0	0	0	0	0	91	7	858	62
Cat 204a-876	Off-site via stormsewer system/Stormtech LID 4	406.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	406	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	348	302	123	0	0	0	858	348	226	0	226	86	86	37	0	0	0	0	0	91	37	858	348
Cat 204a-877	Off-site via stormsewer system/Stormtech LID 4	62.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	62	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	54	302	19	0	0	0	858	54	35	0	35	13	13	6	0	0	0	0	0	91	6	858	54
Cat 204a-878	Off-site via stormsewer system/Stormtech LID 4	60.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	60	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	52	302	18	0	0	0	858	52	33	0	33	13	13	5	0	0	0	0	0	91	5	858	52
Cat 204a-879	Off-site via stormsewer system/Stormtech LID 4	66.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	66	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	57	302	20	0	0	0	858	57	37	0	37	14	14	6	0	0	0	0	0	91	6	858	57
Cat 204a-880	Off-site via stormsewer system/Stormtech LID 4	70.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	70	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	60	302	21	0	0	0	858	60	39	0	39	15	15	6	0	0	0	0	0	91	6	858	60
Cat 204a-881	Off-site via stormsewer system/Stormtech LID 4	60.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	61	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	52	302	18	0	0	0	858	52	34	0	34	13	13	5	0	0	0	0	0	91	5	858	52
Cat 204a-882	Off-site via stormsewer system/Stormtech LID 4	158.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	159	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	136	302	48	0	0	0	858	136	88	0	88	34	34	14	0	0	0	0	0	91	14	858	136
Cat 204a-883	Off-site via stormsewer system/Stormtech LID 4	85.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	85	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	73	302	26	0	0	0	858	73	47	0	47	18	18	8	0	0	0	0	0	91	8	858	73
Cat 204a-884	Off-site via stormsewer system/Stormtech LID 4	67.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	68	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	58	302	20	0	0	0	858	58	38	0	38	14	14	6	0	0	0	0	0	91	6	858	58
Cat 204a-885	Off-site via stormsewer system/Stormtech LID 4	50.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	51	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	44	302	15	0	0	0	858	44	28	0	28	11	11	5	0	0	0	0	0	91	5	858	44
Cat 204a-886	Off-site via stormsewer system/Stormtech LID 4	211.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	212	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	182	302	64	0	0	0	858	182	118	0	118	45	45	19	0	0	0	0	0	91	19	858	182
Cat 204a-887	Off-site via stormsewer system/Stormtech LID 4	52.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	53	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	45	302	16	0	0	0	858	45	29	0	29	11	11	5	0	0	0	0	0	91	5	858	45
Cat 204a-888	Off-site via stormsewer system/Stormtech LID 4	57.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	57	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	49	302	17	0	0	0	858	49	32	0	32	12	12	5	0	0	0	0	0	91	5	858	49
Cat 204a-889	Off-site via stormsewer system/Stormtech LID 4	41.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	41	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	36	302	13	0	0	0	858	36	23	0	23	9	9	4	0	0	0	0	0	91	4	858	36
Cat 204a-890	Off-site via stormsewer system/Stormtech LID 4	9.1	100%	9.1	100%	9.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	7	0	0	0	772	7	772	7	858	8
Cat 204a-891	Off-site via stormsewer system/Stormtech LID 4	1.5	100%	1.5	100%	1.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	1	0	0	772	1	0	858	1	0	0	0	0	0	0	0	1	0	0	0	772	1	772	1	858	1
Cat 204a-892	Off-site via stormsewer system/Stormtech LID 4	1.5	100%	1.5	0%	0.0	100%	1.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	1	0	0	772	1	0	858	1	0	0	0	0	0	0	0	1	0	0	0	772	1	772	1	858	1
Cat 204a-897	Off-site via stormsewer system/Stormtech LID 4	22.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	22	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	19	302	7	0	0	0	858	19	12	0	12	5	5	2	0	0	0	0	0	91	2	858	19
Cat 204a-898	Off-site via stormsewer system/Stormtech LID 4	34.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	34	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	30	302	10	0	0	0	858	30	19	0	19	7	7	3	0	0	0	0	0	91	3	858	30
Cat 204a-899	Off-site via stormsewer system/Stormtech LID 4	50.8	100%	50.8	0%	0.0	100%	50.8	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	44	0	0	772	39	0	858	44	0	4	4	0	0	0	0	39	0	0	0	772	39	772	39	858	44
Cat 204a-900	Off-site via stormsewer system/Stormtech LID 4	20.3	100%	20.3	0%	0.0	100%	20.3	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	17	0	0	772	16	0	858	17	0	2	2	0	0	0	0	16	0	0	0	772	16	772	16	858	17
Post-Development Catchment 204a Total		**22,173**	**73%**	**16,210**	**35%**	**7,742**	**38%**	**8,468**	**0**	**27%**	**5,963**								**858**	**19,018**	**81**	**1,786**	**564**	**12,513**	**0**	**858**	**19,018**	**3,328**	**1,390**	**4,718**	**1,251**	**1,251**	**536**	**0**	**5,976**	**6,536**	**0**	**564**	**12,513**	**588**	**13,048**	**858**	**19,018**
Cat 204b-319	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	1285.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,285	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	1,102	302	388	0	0	0	858	1,102	714	0	714	272	272	116	0	0	0	0	0	91	116	858	1,102
Cat 204b-571	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	296.4	100%	296.4	100%	296.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	254	0	0	772	229	0	858	254	0	25	25	0	0	0	0	229	0	0	772	229	772	229	858	254
Cat 204b-572	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	296.6	100%	296.6	100%	296.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	254	0	0	772	229	0	858	254	0	25	25	0	0	0	0	229	0	0	772	229	772	229	858	254
Cat 204b-573	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	287.8	100%	287.8	100%	287.8	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	247	0	0	772	222	0	858	247	0	25	25	0	0	0	0	222	0	0	772	222	772	222	858	247
Cat 204b-574	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	260.0	100%	260.0	100%	260.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	223	0	0	772	201	0	858	223	0	22	22	0	0	0	0	201	0	0	772	201	772	201	858	223
Cat 204b-575	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	251.0	100%	251.0	100%	251.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	215	0	0	772	194	0	858	215	0	22	22	0	0	0	0	194	0	0	772	194	772	194	858	215
Cat 204b-576	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	253.2	100%	253.2	100%	253.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	217	0	0	772	195	0	858	217	0	22	22	0	0	0	0	195	0	0	772	195	772	195	858	217
Cat 204b-577	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	247.3	100%	247.3	100%	247.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	212	0	0	772	191	0	858	212	0	21	21	0	0	0	0	191	0	0	772	191	772	191	858	212
Cat 204b-578	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	249.1	100%	249.1	100%	249.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	214	0	0	772	192	0	858	214	0	21	21	0	0	0	0	192	0	0	772	192	772	192	858	214
Cat 204b-579	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	252.2	100%	252.2	100%	252.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	216	0	0	772	195	0	858	216	0	22	22	0	0	0	0	195	0	0	772	195	772	195	858	216
Cat 204b-580	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	248.5	100%	248.5	100%	248.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	213	0	0	772	192	0	858	213	0	21	21	0	0	0	0	192	0	0	772	192	772	192	858	213
Cat 204b-581	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	228.1	100%	228.1	100%	228.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	196	0	0	772	176	0	858	196	0	20	20	0	0	0	0	176	0	0	772	176	772	176	858	196
Cat 204b-582	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	197.9	100%	197.9	100%	197.9	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	170	0	0	772	153	0	858	170	0	17	17	0	0	0	0	153	0	0	772	153	772	153	858	170
Cat 204b-583	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	172.2	100%	172.2	100%	172.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	148	0	0	772	133	0	858	148	0	15	15	0	0	0	0	133	0	0	772	133	772	133	858	148
Cat 204b-584	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	136.5	100%	136.5	100%	136.5	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	117	0	0	772	105	0	858	117	0	12	12	0	0	0	0	105	0	0	772	105	772	105	858	117
Cat 204b-585	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	159.0	100%	159.0	100%	159.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	136	0	0	772	123	0	858	136	0	14	14	0	0	0	0	123	0	0	772	123	772	123	858	136
Cat 204b-586	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	254.1	100%	254.1	100%	254.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	218	0	0	772	196	0	858	218	0	22	22	0	0	0	0	196	0	0	772	196	772	196	858	218
Cat 204b-587	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	9.4	100%	9.4	0%	0.0	100%	9.4	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	0	7	0	772	7	772	7	858	8
Cat 204b-588	Off-site via RLCB, storm sewer system, Bioswale LID 1 and Stormtech LID 4	9.5	100%	9.5	0%	0.0	100%	9.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	0	7	0	772	7	772	7	858	8
Post-Development Catchment 204b Total		**5,094**	**75%**	**3,809**	**74%**	**3,790**	**0%**	**19**	**0**	**25%**	**1,285**								**858**	**4,369**	**76**	**388**	**577**	**2,940**	**0**	**858**	**4,369**	**714**	**327**	**1,041**	**272**	**272**	**116**	**0**	**2,926**	**15**	**0**	**577**	**2,940**	**600**	**3,057**	**858**	**4,369**
Post-Development Catchment 204b Total Adjusted (Bioswale)		**5,094**	**75%**	**3,809**	**74%**	**3,790**	**0%**	**19**	**0**	**25%**	**1,285**								**858**	**4,369**	**76**	**388**	**577**	**2,940**	**0**	**858**	**4,369**	**714**	**327**	**1,041**	**272**	**2,717**	**116**	**0**	**2,926**	**15**	**0**	**577**	**2,940**	**120**	**611**	**858**	**4,369**
Cat 204c-321	Off-site via overland flow to Bioswale LID 5 and	836.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	837	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	718	302	253	0	0	0	858	718	465	0	465	177	177	76	0	0	0	0	0	91	76	858	718
Cat 204c-589	Off-site via overland flow to Bioswale LID 5 and	127.0	100%	127.0	100%	127.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	109	0	0	772	98	0	858	109	0	11	11	0	0	0	0	98	0	0	772	98	772	98	858	109
Cat 204c-590	Off-site via overland flow to Bioswale LID 5 and	203.4	100%	203.4	100%	203.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	174	0	0	772	157	0	858	174	0	17	17	0	0	0	0	157	0	0	772	157	772	157	858	174
Cat 204c-591	Off-site via overland flow to Bioswale LID 5 and	224.7	100%	224.7	100%	224.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	193	0	0	772	173	0	858	193	0	19	19	0	0	0	0	173	0	0	772	173	772	173	858	193
Cat 204c-592	Off-site via overland flow to Bioswale LID 5 and	221.3	100%	221.3	100%	221.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	190	0	0	772	171	0	858	190	0	19	19	0	0	0	0	171	0	0	772	171	772	171	858	190
Cat 204c-593	Off-site via overland flow to Bioswale LID 5 and	219.2	100%	219.2	100%	219.2	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	188	0	0	772	169	0	858	188	0	19	19	0	0	0	0	169	0	0	772	169	772	169	858	188
Cat 204c-594	Off-site via overland flow to Bioswale LID 5 and	217.7	100%	217.7	100%	217.7	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	187	0	0	772	168	0	858	187	0	19	19	0	0	0	0	168	0

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

| On-Site Subcatchment Designation | Outlet | Total Area | Impervious | | | | | | Pervious | | MOE TABLE 2 Components | | | | | |

TABLE J-1 POST-DEVELOPMENT WATER BUDGET (BY CATCHMENT) - Reduced LID Capacity
CLIMATIC WATER BUDGET: CLIMATE NORMAL 1971-2000 (WELLAND CLIMATE STATION)
5426, 5452, 5584 Lakeshore Road, Ballantrae
Town of Whitchurch-Stouffville, Ontario

ANNUAL PRECIPITATION	EVAPORATION AND EVAPOTRANSPIRATION FACTORS			
	Impervious Areas		Waterbody	
mm	%	mm	%	mm
858	10%	86	75%	646

On-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted MOE Infiltration Factor	Inputs								Outputs											
			Total Impervious		Assumed Buildings		Assumed Road/ Parking/ Amenities		Other Impervious	Total Pervious								Precipitation				Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff							Total Outputs
																		Annual Average		Surplus (Pervious)		Surplus (Impervious)				Pervious	Impervious	Total Evapotranspiration	Pervious Areas	Total Infiltration	Pervious	Landscaped Area Redirecte	Building	Road/ Driveway/ Amenities	Other Impervious	Total Impervious		Total Runoff		
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography			(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^3/yr)	(m3/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 206a-951	Rear yard swales in Cat 205a	936.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	936	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	858	803	293	274	0	0	0	858	803	529	0	529	206	206	69	0	0	0	0	0	0	73	69	858	803
Cat 206a-952	Rear yard swales in Cat 205a	8953.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	8,953	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	858	7,679	293	2,622	0	0	0	858	7,679	5,057	0	5,057	1,967	1,967	656	0	0	0	0	0	0	73	656	858	7,679
Post-Development Catchment 206a Total		**19,385**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0**	**100%**	**19,385**								**858**	**16,627**	**289**	**5,593**	**0**	**0**	**0**	**858**	**16,627**	**11,034**	**0**	**11,034**	**4,403**	**4,403**	**1,190**	**0**	**0**	**0**	**0**	**0**	**0**	**61**	**1,190**	**858**	**16,627**
Cat 206b-254	Off-site via RLCB and storm sewers to Catchment	745.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	746	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	858	640	284	212	0	0	0	858	640	428	0	428	180	180	32	0	0	0	0	0	0	43	32	858	640
Cat 206b-323	Off-site via RLCB and storm sewers to Catchment	16703.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	16,703	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	858	14,326	293	4,893	0	0	0	858	14,326	9,434	0	9,434	3,669	3,669	1,223	0	0	0	0	0	0	73	1,223	858	14,326
Post-Development Catchment 206b Total		**17,449**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0**	**100%**	**17,449**								**858**	**14,966**	**293**	**5,104**	**0**	**0**	**0**	**858**	**14,966**	**9,861**	**0**	**9,861**	**3,849**	**3,849**	**1,255**	**0**	**0**	**0**	**0**	**0**	**0**	**72**	**1,255**	**858**	**14,966**
Post-Development Catchment 206b Total Adjusted (Stormtech in Catchment 204)		**17,449**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0**	**100%**	**17,449**								**858**	**14,966**	**293**	**5,104**	**0**	**0**	**0**	**858**	**14,966**	**9,861**	**0**	**9,861**	**3,849**	**4,853**	**1,255**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**251**	**858**	**14,966**
Cat 207-318	Off-site via RLCB and storm sewers to Catchment	14751.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	14,752	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	858	12,653	293	4,321	0	0	0	858	12,653	8,332	0	8,332	3,241	3,241	1,080	0	0	0	0	0	0	73	1,080	858	12,653
Post-Development Catchment 207 Total		**14,752**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0**	**100%**	**14,752**								**858**	**12,653**	**293**	**4,321**	**0**	**0**	**0**	**858**	**12,653**	**8,332**	**0**	**8,332**	**3,241**	**3,241**	**1,080**	**0**	**0**	**0**	**0**	**0**	**0**	**73**	**1,080**	**858**	**12,653**
Post-Development Catchment 207 Total Adjusted (Stormtech in Catchment 204)		**14,752**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0**	**100%**	**14,752**								**858**	**12,653**	**293**	**4,321**	**0**	**0**	**0**	**858**	**12,653**	**8,332**	**0**	**8,332**	**3,241**	**4,105**	**1,080**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	**216**	**858**	**12,653**
Cat 209-23	Off-site via overland flow/creek	109.1	100%	109.1	100%	109.1	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	94	0	0	772	84	0	858	94	0	9	9	0	0	0	0	84	0	0	772	84	772	84	858	94
Cat 209-24	Off-site via overland flow/creek	124.0	100%	124.0	100%	124.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	106	0	0	772	96	0	858	106	0	11	11	0	0	0	0	96	0	0	772	96	772	96	858	106
Cat 209-25	Off-site via overland flow/creek	430.0	100%	430.0	100%	430.0	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	369	0	0	772	332	0	858	369	0	37	37	0	0	0	0	332	0	0	772	332	772	332	858	369
Cat 209-26	Off-site via overland flow/creek	228.6	100%	228.6	100%	228.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.15	0.55	0	858	196	0	0	772	176	0	858	196	0	20	20	0	0	0	0	176	0	0	772	176	772	176	858	196
Cat 209-27	Off-site via overland flow/creek	340.3	100%	340.3	100%	340.3	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.15	0.55	0	858	292	0	0	772	263	0	858	292	0	29	29	0	0	0	0	263	0	0	772	263	772	263	858	292
Cat 209-28	Off-site via overland flow/creek	189.8	0%	0.0	0%	0.0	100%	0.0	0.0	100%	190	Gravel	0.05	Silt Loam	0.4	0.15	0.6	0.6	858	163	302	57	0	0	0	858	163	106	0	106	34	34	23	0	0	0	0	0	0	121	23	858	163
Cat 209-29	Off-site via overland flow/creek	172.5	100%	172.5	0%	0.0	100%	172.5	0.0	0%	0	Patio	0	Silt Loam	0.4	0.15	0.55	0	858	148	0	0	772	133	0	858	148	0	15	15	0	0	0	0	0	133	0	772	133	772	133	858	148
Cat 209-30	Off-site via overland flow/creek	2427.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	2,428	Wooded Area	0.2	Silt Loam	0.4	0.15	0.75	0.75	858	2,082	284	689	0	0	0	858	2,082	1,393	0	1,393	517	517	172	0	0	0	0	0	0	71	172	858	2,082
Cat 209-290	Off-site via overland flow/creek	266.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	267	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	229	284	76	0	0	0	858	229	153	0	153	61	61	15	0	0	0	0	0	0	57	15	858	229
Cat 209-293	Off-site via overland flow/creek	7.7	100%	7.7	0%	0.0	100%	7.7	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	7	0	0	772	6	0	858	7	0	1	1	0	0	0	0	0	6	0	772	6	772	6	858	7
Cat 209-312	Off-site via overland flow/creek	1634.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,635	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	858	1,402	293	479	0	0	0	858	1,402	923	0	923	359	359	120	0	0	0	0	0	0	73	120	858	1,402
Cat 209-313	Off-site via overland flow/creek	4730.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	4,730	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	4,057	284	1,343	0	0	0	858	4,057	2,714	0	2,714	1,074	1,074	269	0	0	0	0	0	0	57	269	858	4,057
Cat 209-314	Off-site via overland flow/creek	220.3	0%	0.0	0%	0.0	0%	0.0	0.0	100%	220	Lawns Stormtech	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	189	302	67	0	0	0	858	189	122	0	122	47	47	20	0	0	0	0	0	0	91	20	858	189
Cat 209-315	Off-site via overland flow/creek	56.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	56	Lawns	0.05	Silt Loam	0.4	0.15	0.6	0.6	858	48	302	17	0	0	0	858	48	31	0	31	10	10	7	0	0	0	0	0	0	121	7	858	48
Cat 209-325	Off-site via overland flow/creek	293.6	100%	293.6	100%	293.6	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	252	0	0	772	227	0	858	252	0	25	25	0	0	0	0	227	0	0	772	227	772	227	858	252
Cat 209-326	Off-site via overland flow/creek	295.4	100%	295.4	100%	295.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	253	0	0	772	228	0	858	253	0	25	25	0	0	0	0	228	0	0	772	228	772	228	858	253
Cat 209-327	Off-site via overland flow/creek	298.4	100%	298.4	100%	298.4	0%	0.0	0.0	0%	0	Building	0	Silt Loam	0.4	0.25	0.65	0	858	256	0	0	772	230	0	858	256	0	26	26	0	0	0	0	230	0	0	772	230	772	230	858	256
Cat 209-328	Off-site via overland flow/creek	10.9	100%	10.9	0%	0.0	100%	10.9	0.0	0%	0	Porch	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	8	0	858	9	0	1	1	0	0	0	0	0	8	0	772	8	772	8	858	9
Cat 209-329	Off-site via overland flow/creek	7.5	100%	7.5	0%	0.0	100%	7.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	6	0	0	772	6	0	858	6	0	1	1	0	0	0	0	0	6	0	772	6	772	6	858	6
Cat 209-330	Off-site via overland flow/creek	9.5	100%	9.5	0%	0.0	100%	9.5	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	8	0	0	772	7	0	858	8	0	1	1	0	0	0	0	0	7	0	772	7	772	7	858	8
Cat 209-331	Off-site via overland flow/creek	89.7	100%	89.7	0%	0.0	100%	89.7	0.0	0%	0	Driveway	0	Silt Loam	0.4	0.25	0.65	0	858	77	0	0	772	69	0	858	77	0	8	8	0	0	0	0	0	69	0	772	69	772	69	858	77
Cat 209-332	Off-site via overland flow/creek	209.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	210	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	180	212	44	0	0	0	858	180	135	0	135	44	44	0	0	0	0	0	0	0	0	0	858	180
Cat 209-333	Off-site via overland flow/creek	352.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	352	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	302	212	75	0	0	0	858	302	227	0	227	75	75	0	0	0	0	0	0	0	0	0	858	302
Cat 209-334	Off-site via overland flow/creek	209.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	210	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	180	212	44	0	0	0	858	180	136	0	136	44	44	0	0	0	0	0	0	0	0	0	858	180
Cat 209-335	Off-site via overland flow/creek	53.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	53	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	46	212	11	0	0	0	858	46	34	0	34	11	11	0	0	0	0	0	0	0	0	0	858	46
Cat 209-336	Off-site via overland flow/creek	62.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	62	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	53	212	13	0	0	0	858	53	40	0	40	13	13	0	0	0	0	0	0	0	0	0	858	53
Cat 209-337	Off-site via overland flow/creek	24.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	25	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	21	212	5	0	0	0	858	21	16	0	16	5	5	0	0	0	0	0	0	0	0	0	858	21
Cat 209-631	Off-site via overland flow/creek	2037.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	2,037	Lawns Stormtech	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	1,747	302	615	0	0	0	858	1,747	1,132	0	1,132	431	431	185	0	0	0	0	0	0	91	185	858	1,747
Cat 209-632	Off-site via overland flow/creek	1140.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,140	Lawns Stormtech	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	978	302	344	0	0	0	858	978	634	0	634	241	241	103	0	0	0	0	0	0	91	103	858	978
Cat 209-635	Off-site via overland flow/creek	1776.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,777	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	1,524	212	376	0	0	0	858	1,524	1,148	0	1,148	376	376	0	0	0	0	0	0	0	0	0	858	1,524
Cat 209-636	Off-site via overland flow/creek	1808.8	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,809	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	858	1,551	284	514	0	0	0	858	1,551	1,038	0	1,038	437	437	77	0	0	0	0	0	0	43	77	858	1,551
Cat 209-637	Off-site via overland flow/creek	355.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	356	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	305	284	101	0	0	0	858	305	204	0	204	81	81	20	0	0	0	0	0	0	57	20	858	305
Cat 209-639	Off-site via overland flow/creek	17.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	18	Ponds	1	Silt Loam	0.4	0.25	1.65	1	858	15	212	4	0	0	0	858	15	12	0	12	4	4	0	0	0	0	0	0	0	0	0	858	15
Cat 209-641	Off-site via overland flow/creek	453.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	453	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	389	284	129	0	0	0	858	389	260	0	260	103	103	26	0	0	0	0	0	0	57	26	858	389
Cat 209-642	Off-site via overland flow/creek	101.6	100%	101.6	0%	0.0	100%	101.6	0.0	0%	0	Road	0	Silt Loam	0.4	0.25	0.65	0	858	87	0	0	772	78	0	858	87	0	9	9	0	0	0	0	0	78	0	772	78	772	78	858	87
Cat 209-643	Off-site via overland flow/creek	10.2	80%	8.1	0%	0.0	100%	8.1	0.0	20%	2	Concrete	0	Silt Loam	0.4	0.25	0.65	0	858	9	0	0	772	6	0	858	9	2	1	2	0	0	0	0	0	6	0	618	6	618	6	858	9
Cat 209-695	Off-site via overland flow/creek	1826.2	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,826	Lawns Stormtech	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	1,566	302	551	0	0	0	858	1,566	1,015	0	1,015	386	386	165	0	0	0	0	0	0	91	165	858	1,566
Cat 209-696	Off-site via overland flow/creek	102.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	103	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	88	284	29	0	0	0	858	88	59	0	59	23	23	6	0	0	0	0	0	0	57	6	858	88
Cat 209-722	Off-site via overland flow/creek	29805.7	0%	0.0	0%	0.0	0%	0.0	0.0	100%	29,806	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	858	25,564	293	8,731	0	0	0	521	875	26,085	16,834	0	16,834	6,939	6,939	2,313	0	0	0	0	0	0	78	2,313	875	26,085
Cat 209-723	Off-site via overland flow/creek	25.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	26	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	22	302	8	0	0	0	858	22	14	0	14	5	5	2	0	0	0	0	0	0	91	2	858	22
Cat 209-724	Off-site via overland flow/creek	34.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	34	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	30	284	10	0	0	0	858	30	20	0	20	8	8	2	0	0	0	0	0	0	57	2	858	30
Cat 209-725	Off-site via overland flow/creek	194.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	195	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	167	284	55	0	0	0	858	167	112	0	112	44	44	11	0	0	0	0	0	0	57	11	858	167
Cat 209-726	Off-site via overland flow/creek	309.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	310	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	266	302	93	0	0	0	858	266	172	0	172	65	65	28	0	0	0	0	0	0	91	28	858	266
Cat 209-796	Off-site via overland flow/creek	611.5	0%	0.0	0%	0.0	100%	0.0	0.0	100%	612	Gravel	0.05	Silt Loam	0.4	0.15	0.6	0.6	858	525	302	185	0	0	0	858	525	340	0	340	111	111	74	0	0	0	0	0	0	121	74	858	525
Cat 209-829	Off-site via overland flow/creek	5739.1	0%	0.0	0%	0.0	0%	0.0	0.0	100%	5,739	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	4,922	302	1,733	0	0	0	858	4,922	3,190	0	3,190	1,213	1,213	520	0	0	0	0	0	0	91	520	858	4,922
Cat 209-895	Off-site via overland flow/creek	3797.4	0%	0.0	0%	0.0	0%	0.0	0.0	100%	3,797	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	858	3,257	284	1,078	0	0	0	858	3,257	2,179	0	2,179	916	916	162	0	0	0	0	0	0	43	162	858	3,257
Cat 209-896	Off-site via overland flow/creek	5712.0	0%	0.0	0%	0.0	0%	0.0	0.0	100%	5,712	Lawns	0.05	Silt Loam	0.4	0.15	0.6	0.6	858	4,899	302	1,725	0	0	0	858	4,899	3,175	0	3,175	1,035	1,035	690	0	0	0	0	0	0	121	690	858	4,899
Cat 209-938	Off-site via overland flow/creek	11808.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	11,809	Uncultivated	0.15	Silt Loam	0.4	0.25	0.8	0.8	858	10,128	284	3,353	0	0	0	858	10,128	6,776	0	6,776	2,682	2,682	671	0	0	0	0	0	0	57	671	858	10,128
Post-Development Catchment 209 Total		**80,523**	**3%**	**2,527**	**3%**	**2,120**	**1%**	**407**	**0**	**97%**	**77,996**								**858**	**69,065**	**280**	**22,553**	**24**	**1,951**	**521**	**864**	**69,586**	**44,344**	**217**	**44,561**	**17,395**	**17,395**	**5,679**	**0**	**1,636**	**315**	**0**	**24**	**1,951**	**95**	**7,630**	**864**	**69,586**
Total Site		**269,142**	**24%**	**65,872**	**16%**	**42,571**	**9%**	**23,301**	**0**	**76%**	**203,270**								**858**	**230,843**	**219**	**59,061**	**189**	**50,849**	**2,483**	**867**	**233,326**	**115,284**	**5,650**	**120,933**	**46,804**	**46,804**	**14,740**	**0**	**32,862**	**17,987**	**0**	**2,226**	**50,849**	**244**	**65,589**	**867**	**233,326**
Total Site Adjusted		**269,142**	**24%**	**65,872**	**16%**	**42,571**	**9%**	**23,301**	**0**	**76%**	**203,270**								**858**	**230,843**	**219**	**59,061**	**189**	**50,849**	**2,483**	**867**	**233,326**	**115,284**	**5,650**	**120,933**	**46,804**	**76,100**	**14,740**	**0**	**32,862**	**17,987**	**0**	**2,226**	**50,849**	**135**	**36,293**	**867**	**233,326**

External Areas

Off-Site Subcatchment Designation	Outlet	Total Area	Impervious						Pervious		MOE TABLE 2 Components					MOE Infiltration Factor	Adjusted Infiltration Factor	Precipitation				Run-on	Total Inputs	Evapotranspiration			Infiltration		Runoff							Total Outputs
			Total Impervious		Assumed Buildings		Assumed Parking/ Amenities		Other Impervious	Total Pervious								Annual Average			Surplus			Pervious	Impervious	Total Evapotrans	Pervious Areas	Total Infiltration	Pervious		Building	Driveway/ Amenities	Other Impervio	Total Impervious		Total Runoff		
		(m^2)	% of Total Area	(m^2)	% of Impervious Area	(m^2)	% of Impervious Area	(m^2)	(m^2)	% of Total Area	(m^2)	Cover		Soil		Topography			(mm/yr)	(m^3/yr)			(mm/yr)	(m^3/yr)	(m^3/yr)	(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^3/yr)	(m^3/yr)	(m^2/yr)		(m^2/yr)	(m^2/yr)	(m^2/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)
Cat 208-720	On-site to rear lots of Catchment 201a and 201b	2636.5	0%	0.0	0%	0.0	0%	0.0	0.0	100%	2,637	Lawns	0.05	Silt Loam	0.4	0.25	0.7	0.7	858	2,261	302	796	0	0	0	858	2,261	1,465	0	1,465	557	557	239	0	0	0	0	0	0	91	239	858	2,261
Post-Development Catchment 208 Total		**2,637**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0**	**100%**	**2,637**								**858**	**2,261**			**0**	**0**	**0**	**858**	**2,261**	**1,465**	**0**	**1,465**	**557**	**557**	**239**	**0**	**0**	**0**	**0**	**0**	**0**	**91**	**239**	**858**	**2,261**
Cat 211-253	On-site to Catchment 205-937	22654.9	0%	0.0	0%	0.0	0%	0.0	0.0	100%	22,655	Cultivated	0.1	Silt Loam	0.4	0.25	0.75	0.75	858	19,431	293	6,636	0	0	0	858	19,431	12,795	0	12,795	4,977	4,977	1,659	0	0	0	0	0	0	73	1,659	858	19,431
Cat 211-721	On-site to Catchment 205-937	1502.6	0%	0.0	0%	0.0	0%	0.0	0.0	100%	1,503	Wooded Area	0.2	Silt Loam	0.4	0.25	0.85	0.85	858	1,289	284	427	0	0	0	858	1,289	862	0	862	363	363	64	0	0	0	0	0	0	43	64	858	1,289
Post-Development Catchment 211 Total		**24,158**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0**	**100%

APPENDIX

K DEWATERING ESTIMATES – UTILITIES

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Santiary Trench Inverts +1.0m Between 0 and 1.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	1	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.2	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	11	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	22	m
Radius outside well	Ro	18	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	4	m

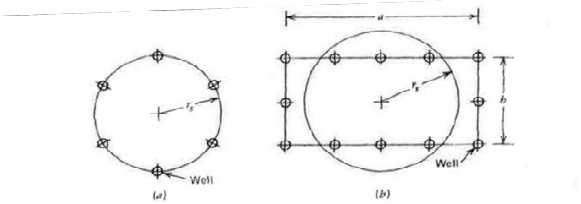


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	6	m3/day
Q	5,959	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	6	m3/day
Q	5,959	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

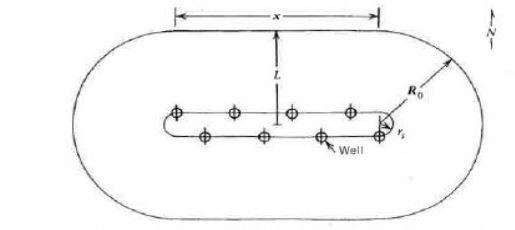
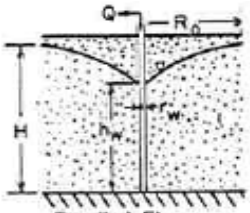
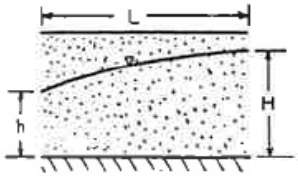


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site: 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Santiary Trench Inverts +1.0m between 1.0 and 2.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	2	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.2	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	20	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	40	m
Radius outside well	Ro	36	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	4	m

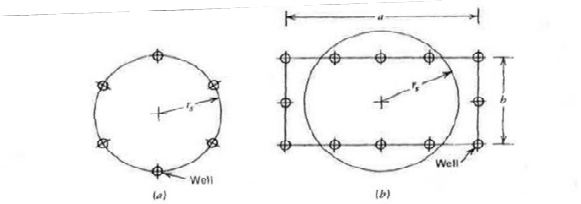


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	18	m3/day
Q	17,502	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	18	m3/day
Q	17,502	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

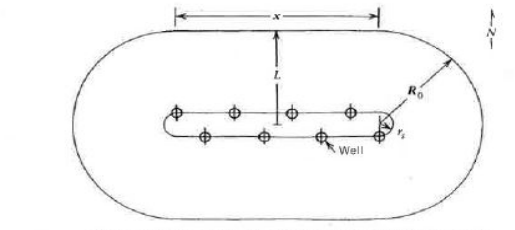
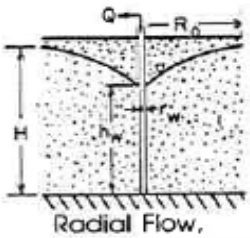
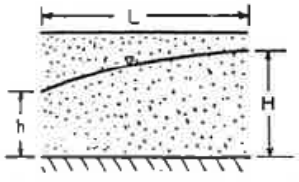


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Santiary Trench Inverts +1.0m between 2.0-3.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	3	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.2	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	29	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	58	m
Radius outside well	Ro	54	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	4	m

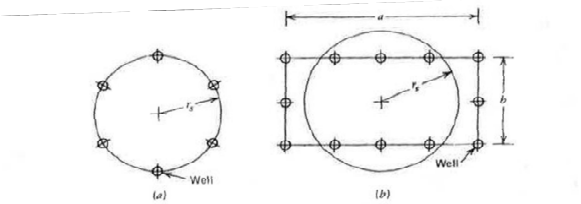


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	34	m3/day
Q	33,774	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	34	m3/day
Q	33,774	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

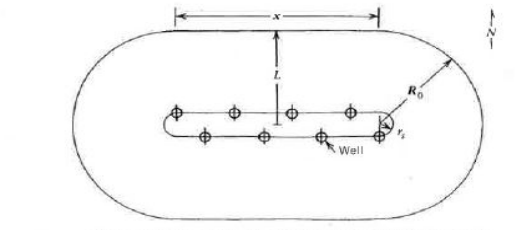
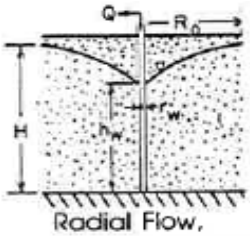
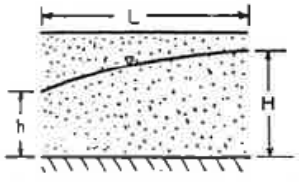


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Santiary Trench Inverts +1.0m Greater Than 3.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	3	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	25	m
Linear Trench Size (m)	b	1.2	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	28	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	57	m
Radius outside well	Ro	54	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	3	m

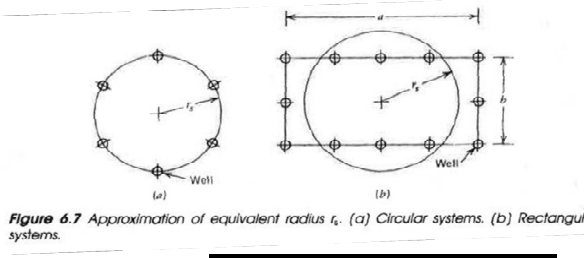


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	30	m3/day
Q	30,015	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	30	m3/day
Q	30,015	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

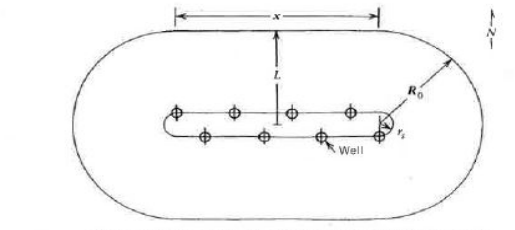
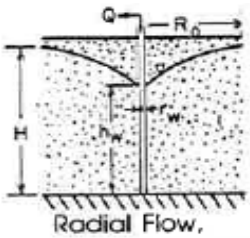
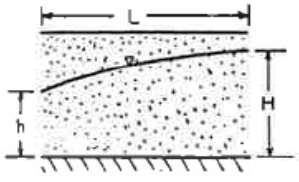


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site

5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (1800 x 900mm) Inverts +1.0m Between 0 and 1.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	1	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	2.8	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	12	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	25	m
Radius outside well	Ro	18	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	7	m

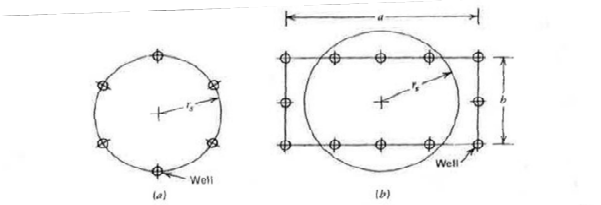


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	7	m3/day
Q	7,444	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	7	m3/day
Q	7,444	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

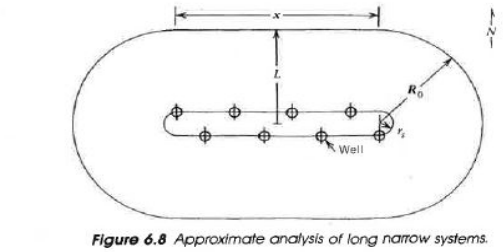
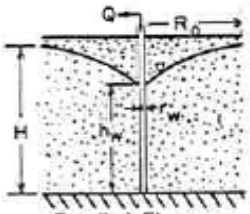
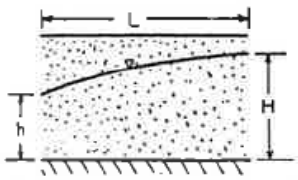


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site

5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (300mm) Inverts +1.0m Between 0 and 1.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	1	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.3	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	11	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	22	m
Radius outside well	Ro	18	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	5	m

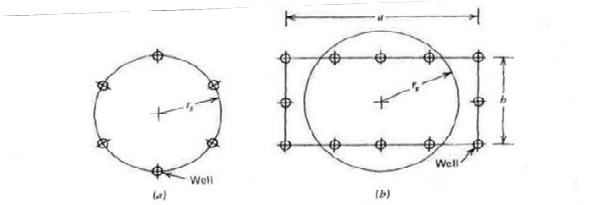


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	6	m3/day
Q	6,079	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	6	m3/day
Q	6,079	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

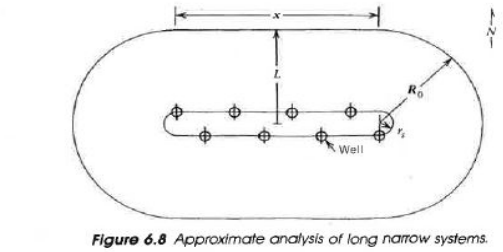
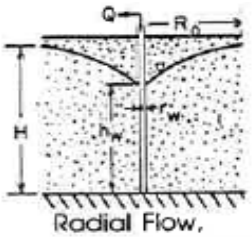
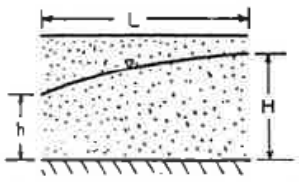


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site

5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (375mm) Inverts +1.0m Between 0 and 1.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	1	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	38.3	m
Linear Trench Size (m)	b	1.375	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	11	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	22	m
Radius outside well	Ro	18	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	4	m

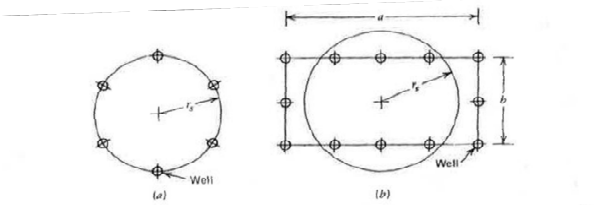


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	6	m3/day
Q	5,772	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	6	m3/day
Q	5,772	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

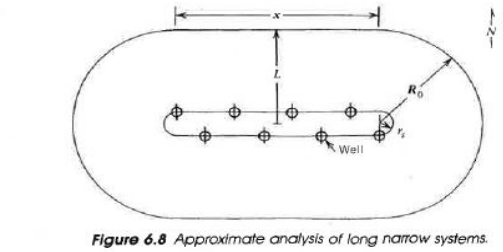
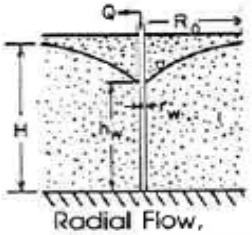
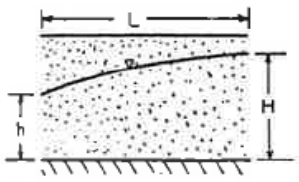


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site: 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (525mm) Inverts +1.0m Between 0 and 1.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	1	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	44.2	m
Linear Trench Size (m)	b	1.525	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	11	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	23	m
Radius outside well	Ro	18	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	5	m

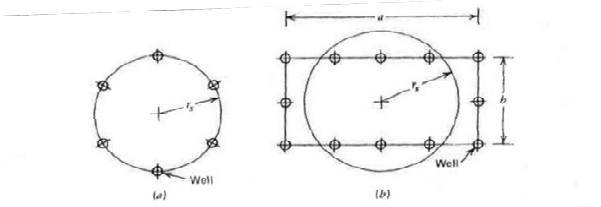


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	6	m3/day
Q	6,134	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	6	m3/day
Q	6,134	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

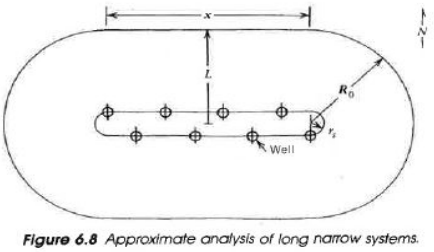
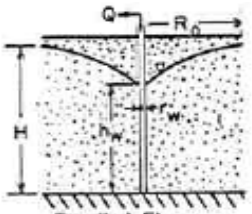
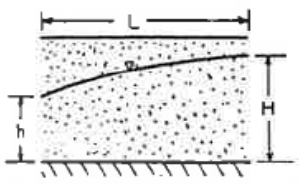


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site: 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (825mm) Inverts +1.0m Between 0 and 1.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	1	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.825	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	12	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	23	m
Radius outside well	Ro	18	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	5	m

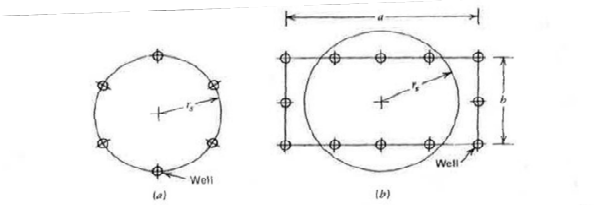


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	7	m3/day
Q	6,630	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	7	m3/day
Q	6,630	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

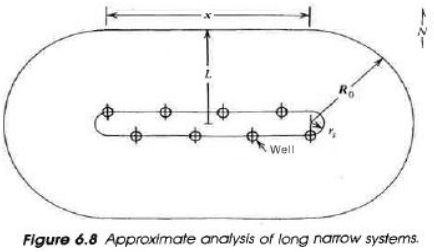
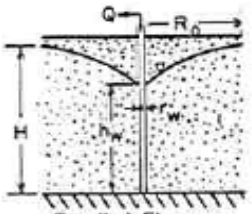
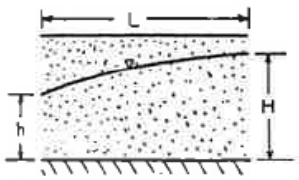


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site

5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (1800 x 900mm) Inverts +1.0m Between 1.0 and 2.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	2	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	2.8	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	21	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	43	m
Radius outside well	Ro	36	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	7	m

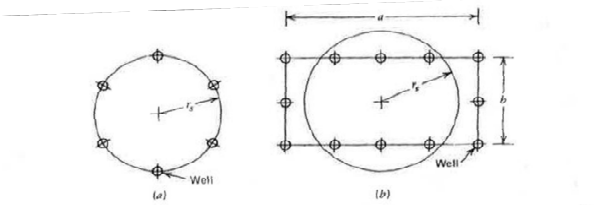


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	21	m3/day
Q	20,978	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	21	m3/day
Q	20,978	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

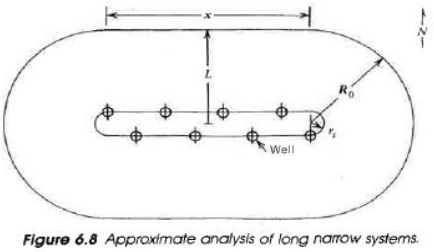
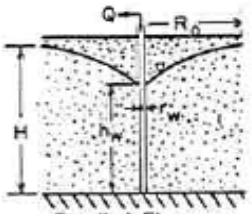
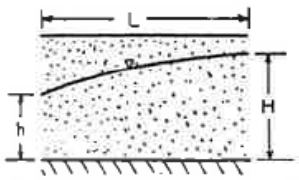


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site: 5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (450mm dia.) Inverts +1.0m Between 1.0 and 2.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	2	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.45	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	20	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	41	m
Radius outside well	Ro	36	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	5	m

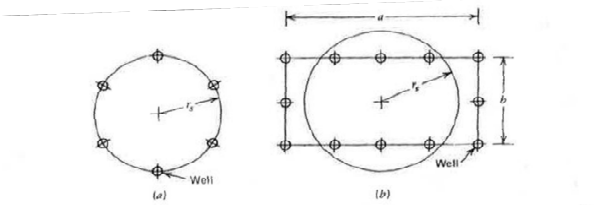


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	18	m3/day
Q	18,190	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	18	m3/day
Q	18,190	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

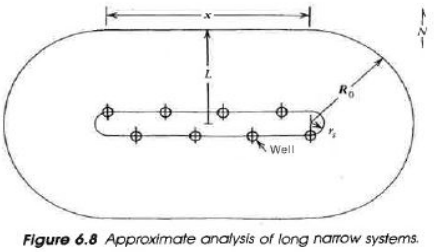
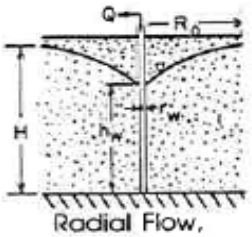
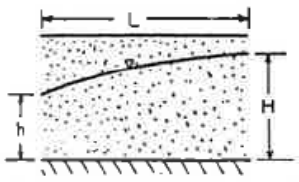


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site

5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (600mm dia.) Inverts +1.0m Between 1.0 and 2.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	2	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.6	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	20	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	41	m
Radius outside well	Ro	36	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	5	m

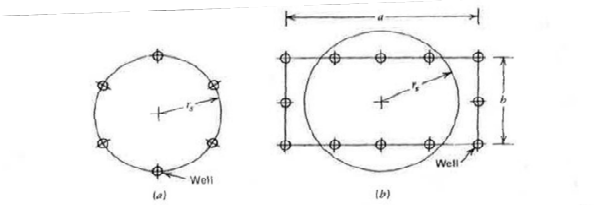


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	19	m3/day
Q	18,566	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	19	m3/day
Q	18,566	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

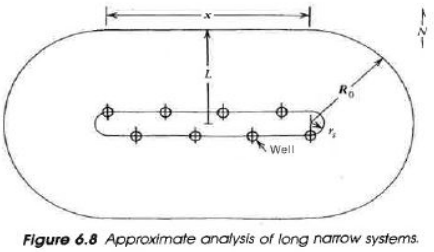
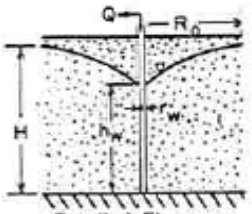
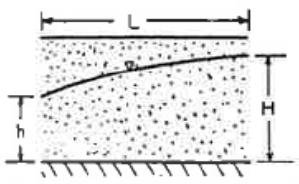


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

Construction Dewatering Worksheet - Unconfined Conditions

from Powers, 1992

Site

5426, 5452 and 5584 Lakeshore Road, Ballantrae, Ontario - Storm Trench (825mm dia.) Inverts +1.0m Between 1.0 and 2.0 m Below Water Table

Input Parameters

Initial Elevation of Water Table (m)	H	2	m
Final Elevation of Water Table (m)	h	0	m
Hydraulic Conductivity (m/s)	K	3.58E-05	m/s
Hydraulic Conductivity (m/d)	K	3.09E+00	m/d
Aquifer Thickness (m)	B	6.10	
Linear Trench Size (m)	a	50	m
Linear Trench Size (m)	b	1.825	m
Length of Dewatering - Trench Length (m)	X	0	m
Width of Dewatering (m)	L	21	m

L = Ro / 2 (eq. 6.15, p. 105)

ZOI - Radius of Influence (m)

Ro = 3 (H - h) x sqrt (K) (eq. 6.14, p. 104)

Well radius + ZOI	Ro + Rs	41	m
Radius outside well	Ro	36	m

Equivalent Radius of Well (m)

Rs = sqrt ((a x b)/ pi) (eq. 6.10, p. 102)

Rs	5	m

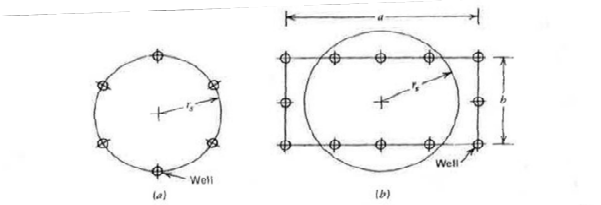


Figure 6.7 Approximation of equivalent radius r_s. (a) Circular systems. (b) Rectangular systems.

Flow Calculations - Q

Radial Flow to a Shaft (a/b < 1.5)

Shaft Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) (Eq. 6.3, p. 99)

Q	19	m3/day
Q	19,089	L/day

Long Narrow System - Trench (a/b > 1.5)

Trench Calculation (m3/day)

Q = (pi x K x (H^2 - h^2)) / ln (Ro / Rs) + 2 x (X x K x (H^2 - h^2)) / 2 x L

Q	19	m3/day
Q	19,089	L/day

Drainage Trench from a Line Source (m3/day)

Q = 2 x X x K x (H^2 - h^2) / 2 x L (eq. 6.9, p. 102)

Q	0	m3/day
Q	-	L/day

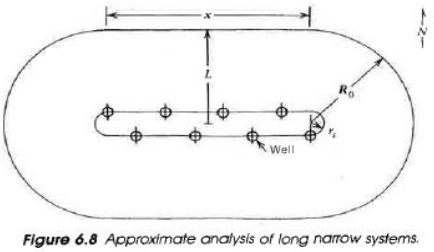
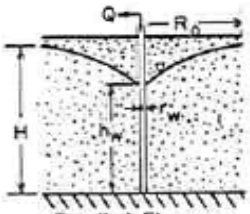
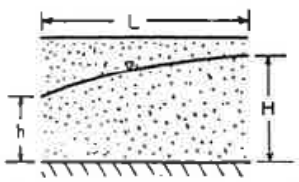


Figure 6.8 Approximate analysis of long narrow systems.



Radial Flow, Water Table Aquifer



Water Table Flow From a Line Source to a Drainage Trench

APPENDIX B

MUNICIPAL DESIGN SHEETS & CROSS SECTIONS

PROJECT TITLE:	Ballantrae Lands
PROJECT No.:	13:286
CLIENT:	Farsight Developments Ltd.
ISSUED FOR:	Functional Servicing Report (November 2022)

SANITARY SEWER DESIGN SHEET
TOWN OF WHITCHURCH-STOUFFVILLE - REGION OF YORK

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Densities (persons/unit):

Single Family, Semi-Detached Residential	3.2
Townhouse, Multi-Family Residential	2.9
Apartment	2.2
Other	3.0

Harmon Peaking Factor:

Maximum: 4
Minimum: 2.0
Formula: $K_H = 1 + \frac{14}{4 + P^{1/2}}$
where; K_H = Harmon Peaking Factor
P = Population in Thousands

Design Flows:

Residential Flow	350	L/person/day
Infiltration Flow	19.872	m^3/ha/day (0.23L/s/ha)
Commercial Flow	24.192	m^2/ha/day (0.26L/s/ha)
Floor Space Index	1	of gross lot area
Institutional Flow	24.192	m^2/ha/day (0.26L/s/ha)

Note:

				RESIDENTIAL											TOTAL AREA		INFILTRATION			PIPE DESIGN							
PROPERTY	**STREET**	**Upstream Manhole**	**Downstream Manhole**	**Section Area (ha)**	**Cummulative Area (ha)**	**Single Family, Semi-Detached Units**	**Townhouse Units**	**High Density Units**	**Other (specified above) Units**	**Unplanned Land (ha)**	**Section Population**	**Cummulative Population (thousands)**	**Harmon Peaking Factor**	**Residential Flow (L/s)**	**Total Section Area (ha)**	**Total Cummulative Area (ha)**	**Applicable Area (ha) (see above)**	**Infiltration Flow (L/s)**	**Total Design Flow (L/s)**	**Type**	**Pipe (mm)**	**Grade (%)**	**Capacity (l/s)**	**Length (m)**	**Velocity (m/s)**	**Down-stream Velocity (m/s)**	**Change in Velocity (m/s)**	**Capacity (%)**
Farsight Homes	Street C	105A	106A	**0.78**	0.78	**10**					32	0.032	4.00	**0.52**	0.78	0.78	0.78	**0.18**	**0.70**	PVC	**200**	**1.00**	32.80	**71.5**	1.04	0.74	0.31	2%
Farsight Homes	Street C	106A	107A	**0.34**	1.12	**5**					16	0.048	4.00	**0.78**	0.34	1.12	1.12	**0.26**	**1.04**	PVC	**200**	**0.50**	23.19	**74.0**	0.74	0.74	0.00	4%
Farsight Homes	Street C	107A	109A	**0.63**	1.75	**10**					32	0.080	4.00	**1.30**	0.63	1.75	1.75	**0.40**	**1.70**	PVC	**200**	**0.50**	23.19	**110.0**	0.74	0.74	0.00	7%
Farsight Homes	Street C	108A	109A	**0.34**	0.34	**6**					20	0.020	4.00	**0.32**	0.34	0.34	0.34	**0.08**	**0.40**	PVC	**200**	**2.00**	46.38	**50.0**	1.48	0.74	0.74	1%
Farsight Homes	Street B	109A	110A	**0.15**	2.24	**2**					7	0.107	4.00	**1.73**	0.15	2.24	2.24	**0.52**	**2.25**	PVC	**200**	**0.50**	23.19	**26.5**	0.74	0.74	0.00	10%
Farsight Homes	Street B	110A	112A	**0.21**	2.45	**3**					10	0.117	4.00	**1.90**	0.21	2.45	2.45	**0.56**	**2.46**	PVC	**200**	**0.50**	23.19	**55.0**	0.74	1.04	0.31	11%
Farsight Homes	Street C	111A	112A	**0.44**	0.44	**7**					23	0.023	4.00	**0.37**	0.44	0.44	0.44	**0.10**	**0.47**	PVC	**200**	**0.50**	23.19	**51.0**	0.74	1.04	0.31	2%
Farsight Homes	Street B	112A	113A	**0.16**	3.05	**2**					7	0.147	4.00	**2.38**	0.16	3.05	3.05	**0.70**	**3.08**	PVC	**200**	**1.00**	32.80	**30.0**	1.04	0.74	0.31	9%
Farsight Homes	Street B	113A	114A	**0.09**	3.14	**1**					4	0.151	4.00	**2.45**	0.09	3.14	3.14	**0.72**	**3.17**	PVC	**200**	**0.50**	23.19	**19.0**	0.74	0.74	0.00	14%
Farsight Homes	Street B	114A	115A	**0.23**	3.37	**3**					10	0.161	4.00	**2.61**	0.23	3.37	3.37	**0.78**	**3.38**	PVC	**200**	**0.50**	23.19	**30.0**	0.74	0.74	0.00	15%
Farsight Homes	Street A	104A	115A	**0.62**	0.62	**10**					32	0.032	4.00	**0.52**	0.62	0.62	0.62	**0.14**	**0.66**	PVC	**200**	**1.00**	32.80	**77.0**	1.04	0.74	0.31	2%
Farsight Homes	Street A	115A	116A	**0.09**	4.08	**0**					0	0.193	4.00	**3.13**	0.09	4.08	4.08	**0.94**	**4.07**	PVC	**200**	**0.50**	23.19	**63.0**	0.74	0.74	0.00	18%
Farsight Homes	Street A	116A	117A	**0.03**	4.11	**0**					0	0.193	4.00	**3.13**	0.03	4.11	4.11	**0.95**	**4.07**	PVC	**200**	**0.50**	23.19	**9.0**	0.74	0.74	0.00	18%
Farsight Homes	Street D	117A	118A	**0.07**	4.18	**1**					4	0.197	4.00	**3.19**	0.07	4.18	4.18	**0.96**	**4.15**	PVC	**200**	**0.50**	23.19	**10.5**	0.74	0.74	0.00	18%
Farsight Homes	Street D	119A	118A	**0.51**	0.51	**8**					26	0.026	4.00	**0.42**	0.51	0.51	0.51	**0.12**	**0.54**	PVC	**200**	**1.00**	32.80	**56.0**	1.04	0.74	0.31	2%
Farsight Homes	Block 147	118A	120A	**0.01**	4.70	**0**					0	0.223	4.00	**3.61**	0.01	4.70	4.70	**1.08**	**4.69**	PVC	**200**	**0.50**	23.19	**38.0**	0.74	0.74	0.00	20%
Farsight Homes	Street E	1W	2A	**0.29**	0.29	**3**					10	0.010	4.00	**0.16**	0.29	0.29	0.29	**0.07**	**0.23**	PVC	**200**	**1.00**	32.80	**61.5**	1.04	0.74	0.31	1%
Farsight Homes	Street E	2A	3A	**0.15**	0.44	**2**					7	0.017	4.00	**0.28**	0.15	0.44	0.44	**0.10**	**0.38**	PVC	**200**	**0.50**	23.19	**13.0**	0.74	0.00	0.74	2%
Farsight Homes	Street E	3A	4A	**0.14**	0.58	**2**					7	0.024	4.00	**0.39**	0.14	0.58	0.58	**0.13**	**0.52**	PVC	**200**	**0.50**	23.19	**14.0**	0.74	0.74	0.00	2%
Farsight Homes	Street E	4A	5A	**0.57**	1.15	**9**					29	0.053	4.00	**0.86**	0.57	1.15	1.15	**0.26**	**1.12**	PVC	**200**	**0.50**	23.19	**85.0**	0.74	0.74	0.00	5%
Farsight Homes	Street E	5A	7A	**0.84**	1.99	**15**					48	0.101	4.00	**1.64**	0.84	1.99	1.99	**0.46**	**2.09**	PVC	**200**	**0.50**	23.19	**110.0**	0.74	0.74	0.00	9%
Farsight Homes	Street A	6A	7A	**0.10**	0.10	**1**					4	0.004	4.00	**0.06**	0.10	0.10	0.10	**0.02**	**0.09**	PVC	**200**	**1.00**	32.80	**13.0**	1.04	0.74	0.31	0%
Farsight Homes	Street A	7A	9A	**0.32**	2.41	**4**					13	0.118	4.00	**1.91**	0.32	2.41	2.41	**0.55**	**2.47**	PVC	**200**	**0.50**	23.19	**76.0**	0.74	0.74	0.00	11%
Farsight Homes	Street A	13A	1A	**0.21**	0.21	**2**					7	0.007	4.00	**0.11**	0.21	0.21	0.21	**0.05**	**0.16**	PVC	**200**	**1.00**	32.80	**30.0**	1.04	0.74	0.31	0%
Farsight Homes	Street A	1A	8A	**0.77**	0.98	**13**					42	0.049	4.00	**0.79**	0.77	0.98	0.98	**0.23**	**1.02**	PVC	**200**	**0.50**	23.19	**105.0**	0.74	0.74	0.00	4%
Farsight Homes	Street A	8A	9A	**0.83**	1.81	**14**					45	0.094	4.00	**1.52**	0.83	1.81	1.81	**0.42**	**1.94**	PVC	**200**	**0.50**	23.19	**109.0**	0.74	0.74	0.00	8%
Farsight Homes	Street F	9A	10A	**0.53**	4.75	**9**					29	0.241	4.00	**3.91**	0.53	4.75	4.75	**1.09**	**5.00**	PVC	**200**	**0.50**	23.19	**85.7**	0.74	0.74	0.00	22%
Farsight Homes	Street F	10A	11A	**0.20**	4.95	**1**					4	0.245	4.00	**3.97**	0.20	4.95	4.95	**1.14**	**5.11**	PVC	**200**	**0.50**	23.19	**16.0**	0.74	0.74	0.00	22%
Farsight Homes	Block 147	11A	12A	**0.00**	4.95	**0**					0	0.245	4.00	**3.97**	0.00	4.95	4.95	**1.14**	**5.11**	PVC	**200**	**0.50**	23.19	**34.8**	0.74	0.74	0.00	22%
Farsight Homes	Block 147	12A	120A	**0.00**	4.95	**0**					0	0.245	4.00	**3.97**	0.00	4.95	4.95	**1.14**	**5.11**	PVC	**200**	**0.50**	23.19	**66.0**	0.74	0.74	0.00	22%
Farsight Homes	Block 153	120A	PSMH	**0.02**	9.67	0					0	0.468	3.99	**7.56**	0.02	9.67	9.67	**2.22**	**9.79**	PVC	**200**	**0.50**	23.19	**50.0**	0.74	N/A		42%

PROJECT TITLE:	Ballantrae Lands
PROJECT No.:	13:286
CLIENT:	Farsight Developments Ltd.
ISSUED FOR:	Functional Servcing Report (November 2022)

STORM WATER DESIGN SHEET
5 - YEAR STORM
TOWN OF WHITCHURCH-STOUFFVILLE - REGION OF YORK

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Captured Overland Flow = Q(100yr) - Q(5yr)
Inlet Time (mins): 10.00

Run-off Coefficients:

Park/Open Space	0.20
Single Family	0.60
Townhousing	0.75
Institutional	0.75
Commercial/Asphalt	0.90
Other (if applicable)	0.25
	0.22

IDF Parameters:

Storm:	A	B	C
5 - Year	1015.96	5.255	0.826
25 - Year	1546.81	5.746	0.845
100 - Year	2051.71	6.230	0.860

100 yr flow

Formula: $I_{YR} = \frac{A}{(t + B)^C}$

where; I= Intensity (mm/hr)
t= Time of Concentration (mins)

Note: PVC pipe is manufactured in metric dimensions, therefore, the pipe diameter stated is used to calculate capacity and velocity. However, since concrete pipe is manufactured in imperial dimensions, standard imperial equivalent sizes for the diameter stated have been used to calculate capacity and velocity.

PROPERTY	STREET	Upstream Manhole	Downstream Manhole	A Park/ Open Space (ha)	A Single Family Res. (ha)	A Multi-Family Res. (ha)	A Institutional (ha)	A Commercial / Asphalt (ha)	A Other - Specified Above (ha)	A Other - Specified Above (ha)	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 Flow (l/s)	Q(design) (l/s)	Type	Pipe (mm)	Grade (%)	Capacity (l/s)	Length (m)	Velocity (m/s)	Down-stream Velocity (m/s)	Change in Velocity (m/s)	Time (min)	Total Time (min)	Capacity (%)
EAST OF BRIDGE																																
North Facility																																
Ballantrae	Street A	15	4W		0.39						0.234	0.234	**10.00**	107.00	69.55	150.60	97.89	186.74	121.38		0.00	69.55	PVC	**300**	**1.00**	96.70	**22.5**	1.37	1.12	0.25	0.27	10.27	72%
Ballantrae	Street E	4W	9		0.12						0.072	0.306	10.27	105.44	89.62	148.42	126.16	184.07	156.46		0.00	89.62	PVC	**375**	**0.50**	123.98	**59.0**	1.12	1.12	0.00	0.88	11.15	72%
Ballantrae	Street E	9	10		0.03						0.018	0.324	11.15	100.76	90.69	141.89	127.70	176.06	158.46		0.00	90.69	PVC	**375**	**0.50**	123.98	**14.0**	1.12	1.12	0.00	0.21	11.36	73%
Ballantrae	Street E	10	11		0.03						0.018	0.342	11.36	99.72	94.74	140.43	133.41	174.27	165.56		0.00	94.74	PVC	**375**	**0.50**	123.98	**17.0**	1.12	1.42	0.30	0.25	11.61	76%
Ballantrae	Street E	11	12		0.47						0.282	0.624	11.61	98.49	170.71	138.71	240.42	172.15	298.40		0.00	170.71	CONC	**525**	**0.50**	317.25	**56.5**	1.42	1.39	0.03	0.66	12.27	54%
Ballantrae	Street E	1	12		0.16						0.096	0.096	**10.00**	107.00	28.53	150.60	40.16	186.74	49.80		0.00	28.53	PVC	**300**	**1.00**	96.70	**36.5**	1.37	1.39	0.02	0.44	10.44	30%
Ballantrae	Street E	12	Stormtech 3		0.00						0.000	0.720	12.27	95.40	190.80	134.38	268.76	166.83	333.66		0.00	**333.66**	CONC	**600**	**0.40**	405.13	**4.5**	1.39	N/A		0.05	12.33	82%
South Facility																																
Ballantrae	Street E	1	3		0.50						0.300	0.300	**10.00**	107.00	89.17	150.60	125.50	186.74	155.62		0.00	89.17	PVC	**375**	**0.50**	123.98	**101.0**	1.12	1.28	0.16	1.50	11.50	72%
Ballantrae	Street A	2	3		0.16						0.096	0.096	**10.00**	107.00	28.53	150.60	40.16	186.74	49.80		0.00	28.53	PVC	**300**	**1.00**	96.70	**18.0**	1.37	1.28	0.09	0.22	10.22	30%
Ballantrae	Street A	4S	5		0.12						0.072	0.072	**10.00**	107.00	21.40	150.60	30.12	186.74	37.35		0.00	21.40	PVC	**300**	**1.00**	96.70	**35.0**	1.37	1.28	0.09	0.43	10.43	22%
Ballantrae	Street A	5	6	0.09	0.46						0.294	0.366	10.43	104.59	106.33	147.24	149.69	182.62	185.67		0.00	106.33	CONC	**450**	**0.50**	210.32	**74.0**	1.28	1.39	0.11	0.96	11.39	51%
Ballantrae	Street A	6	7	1.18	0.76						0.692	1.058	11.39	99.57	292.62	140.22	412.09	174.01	511.39		0.00	292.62	CONC	**600**	**0.40**	405.13	**110.0**	1.39	1.51	0.12	1.32	12.71	72%
Ballantrae	Street A	3	7		0.14						0.084	0.480	11.50	99.02	132.03	139.46	185.95	173.07	230.77		0.00	132.03	CONC	**450**	**0.50**	210.32	**76.0**	1.28	1.51	0.23	0.99	12.49	63%
Ballantrae	Street F	7	8	0.16	0.43						0.290	1.828	**12.67**	93.65	475.55	131.93	669.92	163.82	831.83		0.00	475.55	CONC	**750**	**0.35**	687.10	**73.0**	1.51	1.70	0.19	0.81	13.48	69%
Ballantrae	Street F	8	Stormtech 4		0.13						0.078	1.906	13.48	90.31	478.12	127.23	673.63	158.03	836.67		0.00	**836.67**	CONC	**900**	**0.35**	1117.30	**8.0**	1.70	N/A		0.08	13.56	75%

PROJECT TITLE:	Ballantrae Lands
PROJECT No.:	13:286
CLIENT:	Farsight Developments Ltd.
ISSUED FOR:	Functional Servcing Report (November 2022)

STORM WATER DESIGN SHEET
5 - YEAR STORM
TOWN OF WHITCHURCH-STOUFFVILLE - REGION OF YORK

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Captured Overland Flow = Q(100yr) - Q(5yr)
Inlet Time (mins): 10.00

Run-off Coefficients:

Park/Open Space	0.20
Single Family	0.60
Townhousing	0.75
Institutional	0.75
Commercial/Asphalt	0.90
Other (if applicable)	0.25
	0.22

IDF Parameters:

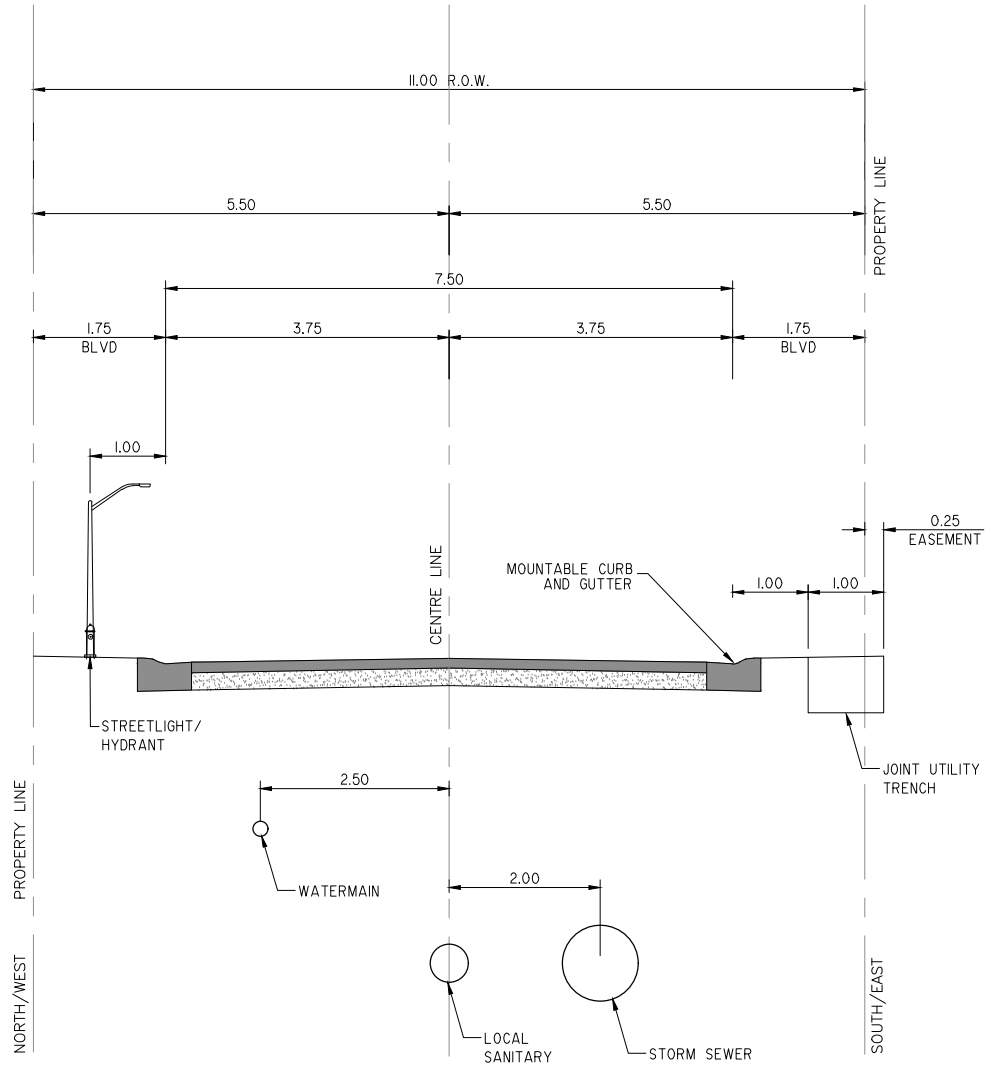
Storm:	A	B	C
5 - Year	1015.96	5.255	0.826
25 - Year	1546.81	5.746	0.845
100 - Year	2051.71	6.230	0.860

100 yr flow

Formula: $I_{YR} = \frac{A}{(t + B)^C}$ where; I= Intensity (mm/hr), t= Time of Concentration (mins)

Note: PVC pipe is manufactured in metric dimensions, therefore, the pipe diameter stated is used to calculate capacity and velocity. However, since concrete pipe is manufactured in imperial dimensions, standard imperial equivalent sizes for the diameter stated have been used to calculate capacity and velocity.

PROPERTY	STREET	Upstream Manhole	Downstream Manhole	A Park/ Open Space (ha)	A Single Family Res. (ha)	A Multi-Family Res. (ha)	A Institutional (ha)	A Commercial / Asphalt (ha)	A Other - Specified Above (ha)	A Other - Specified Above (ha)	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 Flow (l/s)	Q(design) (l/s)	Type	Pipe (mm)	Grade (%)	Capacity (l/s)	Length (m)	Velocity (m/s)	Down-stream Velocity (m/s)	Change in Velocity (m/s)	Time (min)	Total Time (min)	Capacity (%)
WEST OF BRIDGE																																
South Facility																																
Ballantrae	Street B	101	102		0.08						0.048	0.048	**10.00**	107.00	14.27	150.60	20.08	186.74	24.90		0.00	14.27	PVC	**300**	**1.00**	96.70	**42.5**	1.37	1.00	0.36	0.52	10.52	15%
Ballantrae	Street C	102	103		0.43						0.258	0.306	10.52	104.09	88.48	146.54	124.56	181.77	154.50		0.00	88.48	PVC	**375**	**0.40**	110.89	**67.0**	1.00	1.10	0.10	1.11	11.63	80%
Sewer between MH 103 & MH 107 is sized for 100-year conveyance																																
Ballantrae	Block 148	103	107		0.10						0.060	0.366	11.63	98.39	100.03	138.57	140.88	171.99	174.86		0.00	**174.86**	CONC	**525**	**0.30**	245.74	**75.7**	1.10	1.39	0.30	1.15	12.78	71%
Ballantrae	Street B	104	105		0.13						0.078	0.078	**10.00**	107.00	23.18	150.60	32.63	186.74	40.46		0.00	23.18	PVC	**300**	**1.00**	96.70	**41.0**	1.37	0.97	0.40	0.50	10.50	24%
Ballantrae	Street B	105	106		0.10						0.060	0.138	10.50	104.19	39.94	146.68	56.23	181.94	69.74		0.00	39.94	PVC	**300**	**0.50**	68.38	**28.5**	0.97	1.27	0.30	0.49	10.99	58%
Ballantrae	Street A	106	107		0.78						0.468	0.606	10.99	101.58	171.00	143.03	240.78	177.47	298.74		0.00	171.00	CONC	**525**	**0.40**	283.76	**87.0**	1.27	1.39	0.13	1.14	12.13	60%
Sewer between MH 107 & MH 109 is sized for 100-year conveyance																																
Ballantrae	Block 150	107	109		0.07						0.042	1.014	12.78	93.19	262.49	131.29	369.79	163.02	459.18		0.00	**459.18**	CONC	**750**	**0.30**	636.13	**69.0**	1.39	1.49	0.09	0.82	13.60	72%
Ballantrae	Street D	108	109		0.31						0.186	0.186	**10.00**	107.00	55.28	150.60	77.81	186.74	96.48		0.00	55.28	PVC	**375**	**1.00**	175.33	**73.5**	1.59	1.49	0.10	0.77	10.77	32%
Sewer from MH 110 to Stormtech 7 is sized for 100-year conveyance																																
Ballantrae	Block 151	109	110		0.00						0.000	1.200	13.60	89.81	299.38	126.54	421.81	157.18	523.92		0.00	**523.92**	CONC	**825**	**0.30**	820.22	**68.0**	1.49	1.49	0.00	0.76	14.36	64%
Ballantrae	Block 143	110	Stormtech 7		0.00						0.000	1.200	14.36	86.92	289.74	122.48	408.26	152.16	507.20		0.00	**507.20**	CONC	**825**	**0.30**	820.22	**10.0**	1.49	N/A		0.11	14.48	62%
North Facility																																
Ballantrae	Street B	113	114		0.06						0.036	0.036	**10.00**	107.00	10.70	150.60	15.06	186.74	18.67		0.00	10.70	PVC	**300**	**1.00**	96.70	**21.0**	1.37	3.50	2.13	0.26	10.26	11%
Sewers between MH 112 to MH 118 are 1800x900 Box Pipes for 100-yr storage (See Appendix D for Box Pipe Design Calculations)																																
Ballantrae	Street C	112	114		0.24						0.144	0.144	**10.00**	107.00	42.80	150.60	60.24	186.74	74.70		0.00	**74.70**	CONC	**900**	**0.80**	*6545.23*	**50.7**	4.04	3.50	0.54	0.21	10.21	1%
Ballantrae	Street C	114	118		0.37						0.222	0.402	10.26	105.54	117.85	148.56	165.90	184.25	205.74		0.00	**205.74**	CONC	**900**	**0.60**	*5668.34*	**86.0**	3.50	1.28	2.22	0.41	10.67	4%
Ballantrae	Street C	115	116		0.56				0.27		0.404	0.404	**10.00**	107.00	119.93	150.60	168.80	186.74	209.31		0.00	**209.31**	CONC	**525**	**1.00**	448.66	**72.5**	2.01	2.02	0.01	0.60	10.60	47%
Ballantrae	Street C	116	117		0.45					0.49	0.378	0.781	10.60	103.63	224.91	145.90	316.65	180.98	392.79		0.00	**392.79**	CONC	**900**	**0.20**	*3272.62*	**82.0**	2.02	2.02	0.00	0.68	11.28	12%
Ballantrae	Street C	117	118		0.14					0.48	0.190	0.971	11.28	100.12	270.01	140.99	380.24	174.95	471.85		0.00	**471.85**	CONC	**900**	**0.20**	*3272.62*	**28.0**	2.02	1.28	0.74	0.23	11.51	14%
Note: Pipe between MH 118 to the OGS is designed for control release rate for storage. Please refer to Stormwater Management Calculations for details.																																
Ballantrae	Street C	118	OGS		0.00						0.000	1.373	10.67	103.29	393.91	145.42	554.60	180.40	687.97		0.00	**0.631**	CONC	**450**	**0.50**	210.32	**5.5**	1.28	N/A		0.07	10.74	

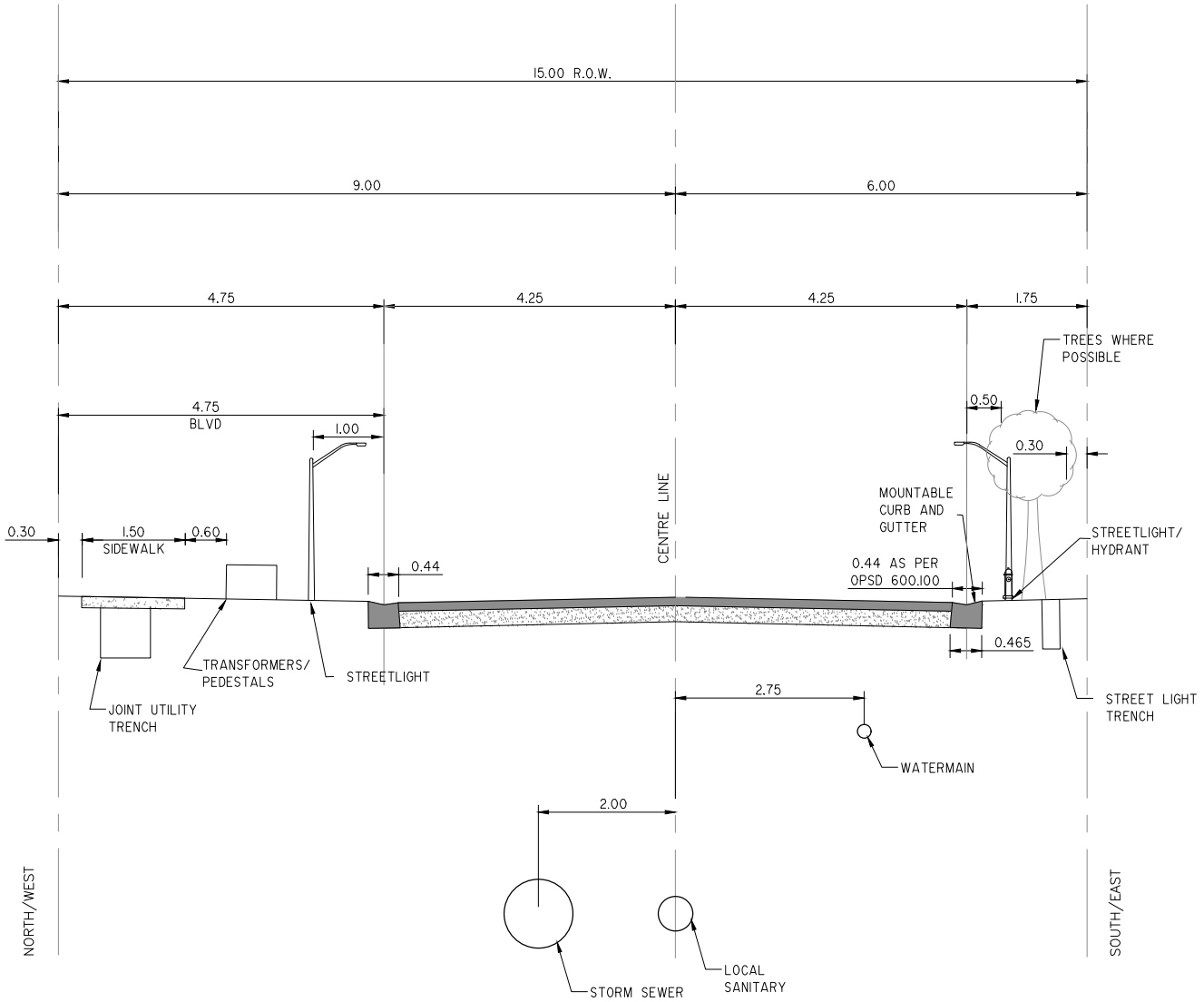


SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

11.0m LOCAL PRIVATE ROADWAY
STREET B/C/D/E/F
CROSS SECTION DETAIL

FIGURE No.

2



SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

15.0m PRIVATE COLLECTOR ROADWAY
STREET A
CROSS SECTION DETAIL

FIGURE No.

1B

APPENDIX C

STORMWATER MANAGEMENT DESIGN CALCULATIONS

QUANTITY CONTROL SIZING CALCULATIONS

13:286
Far Sight Lands
Box Pipe Storage

Ponding Elevation = 332.85 **m**

MH ID	Rise	Rise (m)	DS Inv	Raw Depth	Depth	US Inv	Raw Depth	Depth	Slope	Avg Depth	Span (m)	Area at Depth	Pipe Length	Partially Full	Equivalent Length	Volume
112-114	900	0.900	331.46	0.900	0.900	331.92	0.900	0.900	0.91%	0.900	1.800	1.620	50.7	FALSE	50.7	82.13
114-118	900	0.900	330.53	0.900	0.900	331.46	0.900	0.900	1.08%	0.900	1.800	1.620	86.0	FALSE	86.0	139.32
116-117	900	0.900	330.82	0.900	0.900	330.98	0.900	0.900	0.20%	0.900	1.800	1.620	82.0	FALSE	82.0	132.84
117-118	900	0.900	330.53	0.900	0.900	330.56	0.900	0.900	0.18%	0.900	1.800	1.620	16.5	FALSE	16.5	26.73

Pipe Volume Available = **381** **m^3**

13 286
Far Sight Lands

Storage Discharge Curve Delineation 201

Elevation (masl)	Head on Orifice 1 (m)	Head on Orifice 2 (m)	Head on Overflow (m)	Storage Pipe Volume (m^3)	Total Storage (ham)	Q Orifice 1 (m^3/s)	Q Orifice 2 (m^3/s)	Q Overflow (m^3/s)	Q Total (m^3/s)
330.50	0.00	0.00	0.00	0.00	0.0000	0.000	0.000	0.000	0.000
330.53	0.00	0.00	0.00	0.00	0.0000	0.000	0.000	0.000	0.000
330.60	0.07	0.00	0.00	7.05	0.0007	0.000	0.000	0.000	0.000
330.65	0.12	0.00	0.00	12.41	0.0012	0.000	0.000	0.000	0.000
330.70	0.17	0.00	0.00	17.76	0.0018	0.000	0.000	0.000	0.000
330.75	0.22	0.00	0.00	23.12	0.0023	0.000	0.000	0.000	0.000
330.77	0.24	0.00	0.00	25.26	0.0025	0.000	0.000	0.000	0.000
330.80	0.27	0.00	0.00	28.47	0.0028	0.001	0.000	0.000	0.001
330.85	0.32	0.00	0.00	36.04	0.0036	0.003	0.000	0.000	0.003
330.90	0.37	0.00	0.00	45.09	0.0045	0.004	0.000	0.000	0.004
330.95	0.42	0.00	0.00	54.13	0.0054	0.005	0.000	0.000	0.005
331.00	0.47	0.00	0.00	64.65	0.0065	0.005	0.000	0.000	0.005
331.05	0.52	0.00	0.00	77.39	0.0077	0.006	0.000	0.000	0.006
331.10	0.57	0.00	0.00	90.12	0.0090	0.007	0.000	0.000	0.007
331.15	0.62	0.00	0.00	102.86	0.0103	0.007	0.000	0.000	0.007
331.20	0.67	0.00	0.00	115.59	0.0116	0.008	0.000	0.000	0.008
331.25	0.72	0.00	0.00	128.33	0.0128	0.008	0.000	0.000	0.008
331.30	0.77	0.00	0.00	141.06	0.0141	0.009	0.000	0.000	0.009
331.35	0.82	0.00	0.00	153.80	0.0154	0.009	0.000	0.000	0.009
331.40	0.87	0.00	0.00	166.53	0.0167	0.009	0.000	0.000	0.009
331.45	0.92	0.00	0.00	177.42	0.0177	0.010	0.000	0.000	0.010
331.50	0.97	0.00	0.00	188.20	0.0188	0.010	0.000	0.000	0.010
331.55	1.02	0.00	0.00	200.10	0.0200	0.010	0.000	0.000	0.010
331.60	1.07	0.00	0.00	212.49	0.0212	0.011	0.000	0.000	0.011
331.65	1.12	0.00	0.00	225.38	0.0225	0.011	0.000	0.000	0.011
331.70	1.17	0.05	0.00	238.76	0.0239	0.011	0.000	0.000	0.011
331.75	1.22	0.10	0.00	250.42	0.0250	0.012	0.000	0.000	0.012
331.80	1.27	0.15	0.00	261.11	0.0261	0.012	0.000	0.000	0.012
331.85	1.32	0.20	0.00	272.29	0.0272	0.012	0.000	0.000	0.012
331.88	1.35	0.23	0.00	279.24	0.0279	0.013	0.000	0.000	0.013
331.90	1.37	0.25	0.00	282.49	0.0282	0.013	0.002	0.000	0.015
331.91	1.38	0.26	0.00	284.15	0.0284	0.013	0.004	0.000	0.016
331.95	1.42	0.30	0.04	290.88	0.0291	0.013	0.008	0.000	0.021
332.00	1.47	0.35	0.09	299.32	0.0299	0.013	0.014	0.000	0.027
332.05	1.52	0.40	0.14	307.75	0.0308	0.014	0.020	0.000	0.033
332.10	1.57	0.45	0.19	316.18	0.0316	0.014	0.026	0.000	0.040
332.15	1.62	0.50	0.24	324.62	0.0325	0.014	0.031	0.022	0.067
332.20	1.67	0.55	0.29	333.05	0.0333	0.014	0.035	0.045	0.094
332.25	1.72	0.60	0.34	341.48	0.0341	0.015	0.039	0.067	0.120
332.30	1.77	0.65	0.39	349.91	0.0350	0.015	0.042	0.089	0.146
332.35	1.82	0.70	0.44	358.35	0.0358	0.015	0.045	0.111	0.172
332.40	1.87	0.75	0.49	361.86	0.0362	0.015	0.048	0.134	0.197
332.45	1.92	0.80	0.54	364.14	0.0364	0.016	0.051	0.156	0.223
332.5	1.97	0.85	0.59	366.42	0.0366	0.016	0.054	0.178	0.248
332.55	2.02	0.90	0.64	368.7039	0.0369	0.016	0.056	0.201	0.273
332.6	2.07	0.95	0.69	370.9854	0.0371	0.016	0.058	0.288	0.363
332.65	2.12	1.00	0.74	373.2669	0.0373	0.016	0.061	0.313	0.390
332.7	2.17	1.05	0.79	375.5484	0.0376	0.017	0.063	0.336	0.416
332.75	2.22	1.10	0.84	377.8299	0.0378	0.017	0.065	0.358	0.440
332.8	2.27	1.15	0.89	380.1114	0.0380	0.017	0.067	0.378	0.463
332.85	2.32	1.20	0.94	381.024	0.0381	0.017	0.069	0.398	0.484
332.9	2.37	1.25	0.99	381.024	0.0381	0.018	0.071	0.416	0.505
332.95	2.42	1.30	1.04	381.024	0.0381	0.018	0.073	0.434	0.525
333	2.47	1.35	1.09	381.024	0.0381	0.018	0.075	0.451	0.544

C=0.62	
Diameter of Orifice 1 = 75mm	Elevation of Orifice 1 = 330.77masl
Diameter of Orifice 2 = 185mm	Elevation of Orifice 2 = 331.88masl
Diameter of Overflow Pipe = 450mm	Elevation of Overflow Pipe = 332.10masl

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

13 286
Far Sight Lands
Storage Discharge Curve Delineation 202

Elevation (masl)	Head on Orifice 1 (m)	Head on Orifice 2 (m)	Stormtech Storage (m^3)	Total Storage (ham)	Q Orifice 1 (m^3/s)	Q Orifice 2 (m^3/s)	Q Total (m^3/s)
330.06	0.00	0.00	0.00	0.0000	0.000	0.000	0.000
330.09	0.03	0.00	11.65	0.0012	0.001	0.000	0.001
330.11	0.05	0.00	23.26	0.0023	0.002	0.000	0.002
330.14	0.08	0.00	34.86	0.0035	0.002	0.000	0.002
330.16	0.10	0.00	46.43	0.0046	0.003	0.000	0.003
330.19	0.13	0.00	57.97	0.0058	0.004	0.000	0.004
330.21	0.15	0.00	69.49	0.0069	0.004	0.000	0.004
330.24	0.18	0.00	80.98	0.0081	0.005	0.000	0.005
330.26	0.20	0.00	92.45	0.0092	0.005	0.000	0.005
330.29	0.23	0.00	103.87	0.0104	0.005	0.000	0.005
330.32	0.25	0.00	115.27	0.0115	0.006	0.000	0.006
330.34	0.28	0.00	126.63	0.0127	0.006	0.000	0.006
330.37	0.30	0.00	137.96	0.0138	0.006	0.000	0.006
330.39	0.33	0.03	149.25	0.0149	0.007	0.002	0.009
330.42	0.36	0.05	160.49	0.0160	0.007	0.005	0.012
330.44	0.38	0.08	171.70	0.0172	0.007	0.007	0.014
330.47	0.41	0.10	182.86	0.0183	0.007	0.010	0.017
330.49	0.43	0.13	193.98	0.0194	0.008	0.012	0.020
330.52	0.46	0.15	205.05	0.0205	0.008	0.014	0.022
330.54	0.48	0.18	216.08	0.0216	0.008	0.017	0.025
330.57	0.51	0.20	227.05	0.0227	0.008	0.019	0.028
330.59	0.53	0.23	237.97	0.0238	0.009	0.021	0.030
330.62	0.56	0.25	248.83	0.0249	0.009	0.023	0.032
330.65	0.58	0.28	259.63	0.0260	0.009	0.025	0.034
330.67	0.61	0.30	270.38	0.0270	0.009	0.026	0.035
330.70	0.64	0.33	281.07	0.0281	0.009	0.028	0.037
330.72	0.66	0.36	291.69	0.0292	0.010	0.029	0.039
330.75	0.69	0.38	302.24	0.0302	0.010	0.030	0.040
330.77	0.71	0.41	312.73	0.0313	0.010	0.032	0.042
330.80	0.74	0.43	323.15	0.0323	0.010	0.033	0.043
330.82	0.76	0.46	333.49	0.0333	0.010	0.034	0.044
330.85	0.79	0.48	343.76	0.0344	0.011	0.035	0.046
330.87	0.81	0.51	353.94	0.0354	0.011	0.036	0.047
330.90	0.84	0.53	364.05	0.0364	0.011	0.037	0.048
330.92	0.86	0.56	374.07	0.0374	0.011	0.038	0.049

Elevation (masl)	Head on Orifice 1 (m)	Head on Orifice 2 (m)	StormChamber Storage (m^3)	Total Storage (ham)	Q Orifice 1 (m^3/s)	Q Orifice 2 (m^3/s)	Q Total (m^3/s)
330.95	0.89	0.58	384.01	0.0384	0.011	0.039	0.050
330.98	0.91	0.61	393.85	0.0394	0.011	0.040	0.052

331.00	0.94	0.64	403.59	0.0404	0.012	0.041	0.053
331.03	0.97	0.66	413.24	0.0413	0.012	0.042	0.054
331.05	0.99	0.69	422.78	0.0423	0.012	0.043	0.055
331.08	1.02	0.71	432.22	0.0432	0.012	0.044	0.056
331.10	1.04	0.74	441.54	0.0442	0.012	0.045	0.057
331.13	1.07	0.76	450.75	0.0451	0.012	0.046	0.058
331.15	1.09	0.79	459.83	0.0460	0.012	0.046	0.059
331.18	1.12	0.81	468.78	0.0469	0.013	0.047	0.060
331.20	1.14	0.84	477.60	0.0478	0.013	0.048	0.061
331.23	1.17	0.86	486.27	0.0486	0.013	0.049	0.062
331.25	1.19	0.89	494.80	0.0495	0.013	0.050	0.063
331.28	1.22	0.91	503.15	0.0503	0.013	0.050	0.064
331.31	1.24	0.94	511.34	0.0511	0.013	0.051	0.065
331.33	1.27	0.97	519.33	0.0519	0.013	0.052	0.065
331.36	1.30	0.99	527.12	0.0527	0.014	0.053	0.066
331.38	1.32	1.02	534.68	0.0535	0.014	0.053	0.067
331.41	1.35	1.04	541.97	0.0542	0.014	0.054	0.068
331.43	1.37	1.07	548.94	0.0549	0.014	0.055	0.069
331.46	1.40	1.09	555.41	0.0555	0.014	0.056	0.070
331.48	1.42	1.12	561.43	0.0561	0.014	0.056	0.071
331.51	1.45	1.14	567.31	0.0567	0.014	0.057	0.071
331.53	1.47	1.17	573.07	0.0573	0.015	0.058	0.072
331.56	1.50	1.19	578.72	0.0579	0.015	0.058	0.073
331.59	1.52	1.22	584.19	0.0584	0.015	0.059	0.074
331.61	1.55	1.24	589.56	0.0590	0.015	0.060	0.075
331.64	1.57	1.27	594.94	0.0595	0.015	0.060	0.075
331.66	1.60	1.30	600.31	0.0600	0.015	0.061	0.076
331.69	1.63	1.32	605.68	0.0606	0.015	0.062	0.077
331.71	1.65	1.35	611.05	0.0611	0.015	0.062	0.078
331.74	1.68	1.37	616.42	0.0616	0.016	0.063	0.078
331.76	1.70	1.40	621.80	0.0622	0.016	0.063	0.079
331.79	1.73	1.42	627.17	0.0627	0.016	0.064	0.080
331.81	1.75	1.45	632.54	0.0633	0.016	0.065	0.080
331.84	1.78	1.47	637.91	0.0638	0.016	0.065	0.081
331.86	1.80	1.50	643.29	0.0643	0.016	0.066	0.082
331.89	1.83	1.52	648.66	0.0649	0.016	0.066	0.083

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

C=0.62

Diameter of Orifice 1 = 75mm	Elevation of Orifice 1 = 330.06 masl
Diameter of Orifice 2 = 160mm	Elevation of Orifice 2 = 330.37 masl

Project:

Chamber Model -	MC-4500	
Units -	**Metric**	Click Here for Imperial
Number of Chambers -	138	
Number of chambers -	20	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	329.68	m
Amount of Stone Above Chambers -	305	mm
Amount of Stone Below Chambers -	380	mm

Include Perimeter Stone in Calculations

StormTech MC-4500 Cumulative Storage Volumes

Height of System *(mm)*	Incremental Single Chamber *(cubic meters)*	Incremental Single End Cap *(cubic meters)*	Incremental Chambers *(cubic meters)*	Incremental End Cap *(cubic meters)*	Incremental Stone *(cubic meters)*	Incremental Chamber, End Cap and Stone *(cubic meters)*	Cumulative System *(cubic meters)*	Elevation *(meters)*
2210	0.00	0.00	0.00	0.00	5.372	5.37	729.24	331.89
2184	0.00	0.00	0.00	0.00	5.372	5.37	723.87	331.86
2159	0.00	0.00	0.00	0.00	5.372	5.37	718.50	331.84
2134	0.00	0.00	0.00	0.00	5.372	5.37	713.13	331.81
2108	0.00	0.00	0.00	0.00	5.372	5.37	707.75	331.79
2083	0.00	0.00	0.00	0.00	5.372	5.37	702.38	331.76
2057	0.00	0.00	0.00	0.00	5.372	5.37	697.01	331.74
2032	0.00	0.00	0.00	0.00	5.372	5.37	691.64	331.71
2007	0.00	0.00	0.00	0.00	5.372	5.37	686.26	331.69
1981	0.00	0.00	0.00	0.00	5.372	5.37	680.89	331.66
1956	0.00	0.00	0.00	0.00	5.372	5.37	675.52	331.64
1930	0.00	0.00	0.00	0.00	5.372	5.37	670.15	331.61
1905	0.00	0.00	0.16	0.00	5.308	5.47	664.78	331.59
1880	0.00	0.00	0.45	0.01	5.189	5.65	659.31	331.56
1854	0.00	0.00	0.64	0.01	5.109	5.77	653.66	331.53
1829	0.01	0.00	0.82	0.03	5.035	5.88	647.89	331.51
1803	0.01	0.00	1.05	0.04	4.938	6.02	642.01	331.48
1778	0.01	0.00	1.77	0.05	4.645	6.46	635.99	331.46
1753	0.02	0.00	2.60	0.06	4.307	6.97	629.53	331.43
1727	0.02	0.00	3.12	0.08	4.091	7.29	622.56	331.41
1702	0.03	0.00	3.55	0.09	3.915	7.56	615.26	331.38
1676	0.03	0.01	3.92	0.11	3.761	7.79	607.70	331.36
1651	0.03	0.01	4.25	0.12	3.624	7.99	599.91	331.33
1626	0.03	0.01	4.55	0.14	3.499	8.18	591.92	331.31
1600	0.03	0.01	4.82	0.15	3.382	8.36	583.74	331.28
1575	0.04	0.01	5.08	0.17	3.273	8.52	575.38	331.25
1549	0.04	0.01	5.32	0.18	3.172	8.67	566.86	331.23
1524	0.04	0.01	5.54	0.20	3.076	8.82	558.19	331.20
1499	0.04	0.01	5.76	0.21	2.985	8.95	549.37	331.18
1473	0.04	0.01	5.96	0.22	2.899	9.08	540.42	331.15
1448	0.04	0.01	6.15	0.24	2.817	9.21	531.33	331.13
1422	0.05	0.01	6.34	0.25	2.738	9.32	522.13	331.10
1397	0.05	0.01	6.51	0.26	2.663	9.44	512.80	331.08
1372	0.05	0.01	6.68	0.27	2.591	9.54	503.37	331.05
1346	0.05	0.01	6.84	0.29	2.522	9.65	493.82	331.03
1321	0.05	0.01	6.99	0.30	2.456	9.75	484.18	331.00
1295	0.05	0.02	7.14	0.31	2.393	9.84	474.43	330.98
1270	0.05	0.02	7.28	0.32	2.332	9.93	464.59	330.95
1245	0.05	0.02	7.42	0.33	2.273	10.02	454.66	330.92
1219	0.05	0.02	7.55	0.34	2.216	10.11	444.63	330.90
1194	0.06	0.02	7.68	0.35	2.162	10.19	434.53	330.87
1168	0.06	0.02	7.80	0.36	2.109	10.27	424.34	330.85
1143	0.06	0.02	7.91	0.37	2.058	10.34	414.07	330.82
1118	0.06	0.02	8.03	0.38	2.009	10.42	403.73	330.80
1092	0.06	0.02	8.13	0.39	1.962	10.49	393.31	330.77
1067	0.06	0.02	8.24	0.40	1.917	10.56	382.83	330.75
1041	0.06	0.02	8.34	0.41	1.873	10.62	372.27	330.72
1016	0.06	0.02	8.44	0.42	1.830	10.69	361.65	330.70
991	0.06	0.02	8.53	0.43	1.789	10.75	350.97	330.67
965	0.06	0.02	8.62	0.44	1.750	10.81	340.22	330.65
940	0.06	0.02	8.71	0.45	1.712	10.86	329.41	330.62
914	0.06	0.02	8.79	0.45	1.675	10.92	318.55	330.59
889	0.06	0.02	8.87	0.46	1.639	10.97	307.63	330.57
864	0.06	0.02	8.94	0.48	1.604	11.02	296.66	330.54
838	0.07	0.02	9.02	0.48	1.573	11.07	285.64	330.52
813	0.07	0.02	9.09	0.49	1.542	11.12	274.57	330.49
787	0.07	0.02	9.16	0.49	1.512	11.16	263.45	330.47
762	0.07	0.03	9.22	0.50	1.483	11.21	252.28	330.44
737	0.07	0.03	9.28	0.51	1.455	11.25	241.08	330.42
711	0.07	0.03	9.34	0.52	1.429	11.29	229.83	330.39
686	0.07	0.03	9.40	0.52	1.403	11.33	218.54	330.37
660	0.07	0.03	9.45	0.53	1.379	11.36	207.22	330.34
635	0.07	0.03	9.51	0.54	1.356	11.40	195.86	330.32
610	0.07	0.03	9.55	0.54	1.334	11.43	184.46	330.29
584	0.07	0.03	9.60	0.55	1.313	11.46	173.03	330.26
559	0.07	0.03	9.64	0.55	1.293	11.49	161.57	330.24
533	0.07	0.03	9.68	0.56	1.275	11.52	150.08	330.21
508	0.07	0.03	9.72	0.56	1.257	11.55	138.56	330.19
483	0.07	0.03	9.76	0.57	1.240	11.57	127.01	330.16
457	0.07	0.03	9.79	0.58	1.224	11.59	115.44	330.14
432	0.07	0.03	9.83	0.58	1.209	11.62	103.85	330.11
406	0.07	0.03	9.87	0.58	1.188	11.65	92.23	330.09
381	0.00	0.00	0.00	0.00	5.372	5.37	80.58	330.06
356	0.00	0.00	0.00	0.00	5.372	5.37	75.21	330.04
330	0.00	0.00	0.00	0.00	5.372	5.37	69.84	330.01
305	0.00	0.00	0.00	0.00	5.372	5.37	64.47	329.98
279	0.00	0.00	0.00	0.00	5.372	5.37	59.09	329.96
254	0.00	0.00	0.00	0.00	5.372	5.37	53.72	329.93
229	0.00	0.00	0.00	0.00	5.372	5.37	48.35	329.91

13 286
Far Sight Lands
Storage Discharge Curve Delineation 203

Elevation (masl)	Elevation (masl)	Head on Orifice 1 (m)	Head on Orifice 2 (m)	Stormtech Storage (m^3)	Total Storage (ha-m)	Q Orifice 1 (m^3/s)	Q Orifice 2 (m^3/s)	Q Total (m^3/s)
331.18	331.18	0.00	0.00	0.00	0.0000	0.000	0.000	0.000
331.20	331.20	0.02	0.00	4.72	0.0005	0.001	0.000	0.0006
331.23	331.23	0.05	0.00	9.43	0.0009	0.001	0.000	0.001
331.25	331.25	0.07	0.00	14.13	0.0014	0.002	0.000	0.002
331.28	331.28	0.10	0.00	18.82	0.0019	0.003	0.000	0.003
331.30	331.30	0.12	0.00	23.50	0.0023	0.004	0.000	0.004
331.33	331.33	0.15	0.00	28.17	0.0028	0.004	0.000	0.004
331.35	331.35	0.17	0.00	32.82	0.0033	0.004	0.000	0.004
331.38	331.38	0.20	0.00	37.47	0.0037	0.005	0.000	0.005
331.40	331.40	0.22	0.00	42.10	0.0042	0.005	0.000	0.005
331.43	331.43	0.25	0.00	46.72	0.0047	0.006	0.000	0.006
331.45	331.45	0.27	0.00	51.33	0.0051	0.006	0.000	0.006
331.48	331.48	0.30	0.00	55.92	0.0056	0.006	0.000	0.0062
331.51	331.51	0.33	0.03	60.49	0.0060	0.007	0.004	0.010
331.53	331.53	0.35	0.05	65.05	0.0065	0.007	0.007	0.014
331.56	331.56	0.38	0.08	69.59	0.0070	0.007	0.011	0.018
331.58	331.58	0.40	0.10	74.12	0.0074	0.007	0.015	0.022
331.61	331.61	0.43	0.13	78.62	0.0079	0.008	0.019	0.026
331.63	331.63	0.45	0.15	83.11	0.0083	0.008	0.022	0.030
331.66	331.66	0.48	0.18	87.58	0.0088	0.008	0.026	0.034
331.68	331.68	0.50	0.20	92.03	0.0092	0.008	0.030	0.038
331.71	331.71	0.53	0.23	96.45	0.0096	0.009	0.035	0.043
331.73	331.73	0.55	0.25	100.86	0.0101	0.009	0.038	0.047
331.76	331.76	0.58	0.28	105.24	0.0105	0.009	0.041	0.050
331.78	331.78	0.60	0.30	109.59	0.0110	0.009	0.044	0.053
331.81	331.81	0.63	0.33	113.92	0.0114	0.009	0.047	0.056
331.84	331.84	0.66	0.36	118.23	0.0118	0.010	0.050	0.059
331.86	331.86	0.68	0.38	122.51	0.0123	0.010	0.052	0.062
331.89	331.89	0.71	0.41	126.76	0.0127	0.010	0.055	0.064
331.91	331.91	0.73	0.43	130.98	0.0131	0.010	0.057	0.067
331.94	331.94	0.76	0.46	135.17	0.0135	0.010	0.059	0.069
331.96	331.96	0.78	0.48	139.33	0.0139	0.010	0.061	0.072
331.99	331.99	0.81	0.51	143.46	0.0143	0.011	0.063	0.074
332.01	332.01	0.83	0.53	147.56	0.0148	0.011	0.065	0.076
332.04	332.04	0.86	0.56	151.62	0.0152	0.011	0.067	0.078

Elevation (masl)	Elevation (masl)	Head on Orifice 1 (m)	Head on Orifice 2 (m)	StormChamber Storage (m^3)	Total Storage (ham)	Q Orifice 1 (m^3/s)	Q Orifice 2 (m^3/s)	Q Total (m^3/s)
332.06	332.06	0.88	0.58	155.65	0.0156	0.011	0.069	0.080
332.09	332.09	0.91	0.61	159.64	0.0160	0.011	0.071	0.082
332.12	332.12	0.93	0.63	163.59	0.0164	0.011	0.072	0.084
332.14	332.14	0.96	0.66	167.50	0.0167	0.012	0.074	0.086

332.17	332.17	0.99	0.69	171.37	0.0171	0.012	0.076	0.088
332.19	332.19	1.01	0.71	175.19	0.0175	0.012	0.077	0.089
332.22	332.22	1.04	0.74	178.97	0.0179	0.012	0.079	0.0912
332.24	332.24	1.06	0.76	182.70	0.0183	0.012	0.081	0.093
332.27	332.27	1.09	0.79	186.38	0.0186	0.012	0.082	0.095
332.29	332.29	1.11	0.81	190.01	0.0190	0.013	0.084	0.096
332.32	332.32	1.14	0.84	193.58	0.0194	0.013	0.085	0.098
332.34	332.34	1.16	0.86	197.10	0.0197	0.013	0.087	0.100
332.37	332.37	1.19	0.89	200.55	0.0201	0.013	0.088	0.101
332.39	332.39	1.21	0.91	203.94	0.0204	0.013	0.090	0.1027
332.42	332.42	1.24	0.94	207.26	0.0207	0.013	0.091	0.104
332.45	332.45	1.27	0.97	210.50	0.0210	0.013	0.092	0.106
332.47	332.47	1.29	0.99	213.65	0.0214	0.014	0.094	0.107
332.50	332.50	1.32	1.02	216.72	0.0217	0.014	0.095	0.109
332.52	332.52	1.34	1.04	219.67	0.0220	0.014	0.096	0.110
332.55	332.55	1.37	1.07	222.50	0.0222	0.014	0.098	0.112
332.57	332.57	1.39	1.09	225.12	0.0225	0.014	0.099	0.113
332.60	332.60	1.42	1.12	227.56	0.0228	0.014	0.100	0.114
332.62	332.62	1.44	1.14	229.94	0.0230	0.014	0.101	0.116
332.65	332.65	1.47	1.17	232.28	0.0232	0.015	0.103	0.117
332.67	332.67	1.49	1.19	234.57	0.0235	0.015	0.104	0.119
332.70	332.70	1.52	1.22	236.78	0.0237	0.015	0.105	0.120
332.72	332.72	1.54	1.24	238.96	0.0239	0.015	0.106	0.121
332.75	332.75	1.57	1.27	241.13	0.0241	0.015	0.107	0.123
332.78	332.78	1.60	1.30	243.31	0.0243	0.015	0.109	0.124
332.80	332.80	1.62	1.32	245.49	0.0245	0.015	0.110	0.125
332.83	332.83	1.65	1.35	247.66	0.0248	0.015	0.111	0.12635
332.85	332.85	1.67	1.37	249.84	0.0250	0.016	0.112	0.128
332.88	332.88	1.70	1.40	252.02	0.0252	0.016	0.113	0.129
332.90	332.90	1.72	1.42	254.19	0.0254	0.016	0.114	0.130
332.93	332.93	1.75	1.45	256.37	0.0256	0.016	0.115	0.131
332.95	332.95	1.77	1.47	258.55	0.0259	0.016	0.117	0.133
332.98	332.98	1.80	1.50	260.72	0.0261	0.016	0.118	0.134
333.00	333.00	1.82	1.52	262.90	0.0263	0.016	0.119	0.1349

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

C=0.62

Diameter of Orifice 1 = 75mm	Elevation of Orifice 1 = 331.17 masl
Diameter of Orifice 2 = 215mm	Elevation of Orifice 2 = 331.48masl

Project:

Chamber Model -	MC-4500	
Units -	**Metric**	Click Here for Imperial
Number of Chambers -	56	
Number of chambers -	8	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	330.21	m
Amount of Stone Above Chambers -	305	mm
Amount of Stone Below Chambers -	960	mm

StormTech
Detention • Retention • Water Quality
A division of ADS

☐ Include Perimeter Stone in Calculations

StormTech MC-4500 Cumulative Storage Volumes

Height of System *(mm)*	Incremental Single Chamber *(cubic meters)*	Incremental Single End Cap *(cubic meters)*	Incremental Chambers *(cubic meters)*	Incremental End Cap *(cubic meters)*	Incremental Stone *(cubic meters)*	Incremental Chamber, End Cap and Stone *(cubic meters)*	Cumulative System *(cubic meters)*	Elevation *(meters)*
2794	0.00	0.00	0.00	0.00	2.177	2.18	345.61	333.00
2769	0.00	0.00	0.00	0.00	2.177	2.18	343.43	332.98
2743	0.00	0.00	0.00	0.00	2.177	2.18	341.25	332.95
2718	0.00	0.00	0.00	0.00	2.177	2.18	339.08	332.93
2692	0.00	0.00	0.00	0.00	2.177	2.18	336.90	332.90
2667	0.00	0.00	0.00	0.00	2.177	2.18	334.72	332.88
2642	0.00	0.00	0.00	0.00	2.177	2.18	332.55	332.85
2616	0.00	0.00	0.00	0.00	2.177	2.18	330.37	332.83
2591	0.00	0.00	0.00	0.00	2.177	2.18	328.19	332.80
2565	0.00	0.00	0.00	0.00	2.177	2.18	326.02	332.78
2540	0.00	0.00	0.00	0.00	2.177	2.18	323.84	332.75
2515	0.00	0.00	0.00	0.00	2.177	2.18	321.66	332.72
2489	0.00	0.00	0.06	0.00	2.151	2.22	319.49	332.70
2464	0.00	0.00	0.18	0.00	2.102	2.29	317.27	332.67
2438	0.00	0.00	0.26	0.01	2.070	2.34	314.98	332.65
2413	0.01	0.00	0.33	0.01	2.040	2.38	312.65	332.62
2388	0.01	0.00	0.43	0.02	2.000	2.44	310.27	332.60
2362	0.01	0.00	0.72	0.02	1.881	2.62	307.82	332.57
2337	0.02	0.00	1.05	0.03	1.744	2.82	305.21	332.55
2311	0.02	0.00	1.27	0.03	1.657	2.96	302.38	332.52
2286	0.03	0.00	1.44	0.04	1.585	3.06	299.42	332.50
2261	0.03	0.01	1.59	0.04	1.523	3.16	296.36	332.47
2235	0.03	0.01	1.72	0.05	1.467	3.24	293.20	332.45
2210	0.03	0.01	1.85	0.05	1.417	3.32	289.96	332.42
2184	0.03	0.01	1.96	0.06	1.369	3.39	286.65	332.39
2159	0.04	0.01	2.06	0.07	1.325	3.45	283.26	332.37
2134	0.04	0.01	2.16	0.07	1.284	3.52	279.81	332.34
2108	0.04	0.01	2.25	0.08	1.245	3.57	276.29	332.32
2083	0.04	0.01	2.34	0.08	1.208	3.63	272.72	332.29
2057	0.04	0.01	2.42	0.09	1.173	3.68	269.09	332.27
2032	0.04	0.01	2.50	0.09	1.140	3.73	265.41	332.24
2007	0.05	0.01	2.57	0.10	1.108	3.78	261.68	332.22
1981	0.05	0.01	2.64	0.10	1.078	3.82	257.90	332.19
1956	0.05	0.01	2.71	0.11	1.049	3.87	254.07	332.17
1930	0.05	0.01	2.78	0.11	1.021	3.91	250.20	332.14
1905	0.05	0.01	2.84	0.12	0.994	3.95	246.29	332.12
1880	0.05	0.02	2.90	0.12	0.968	3.99	242.34	332.09
1854	0.05	0.02	2.95	0.13	0.943	4.03	238.35	332.06
1829	0.05	0.02	3.01	0.13	0.920	4.06	234.33	332.04
1803	0.05	0.02	3.06	0.14	0.897	4.10	230.27	332.01
1778	0.06	0.02	3.11	0.14	0.875	4.13	226.17	331.99
1753	0.06	0.02	3.16	0.14	0.853	4.16	222.04	331.96
1727	0.06	0.02	3.21	0.15	0.833	4.19	217.88	331.94
1702	0.06	0.02	3.26	0.15	0.813	4.22	213.69	331.91
1676	0.06	0.02	3.30	0.16	0.794	4.25	209.46	331.89
1651	0.06	0.02	3.34	0.16	0.775	4.28	205.21	331.86
1626	0.06	0.02	3.38	0.16	0.757	4.31	200.94	331.84
1600	0.06	0.02	3.42	0.17	0.740	4.33	196.63	331.81
1575	0.06	0.02	3.46	0.17	0.724	4.36	192.30	331.78
1549	0.06	0.02	3.50	0.17	0.708	4.38	187.94	331.76
1524	0.06	0.02	3.53	0.18	0.692	4.40	183.56	331.73
1499	0.06	0.02	3.57	0.18	0.677	4.43	179.16	331.71
1473	0.06	0.02	3.60	0.19	0.663	4.45	174.74	331.68
1448	0.06	0.02	3.63	0.19	0.648	4.47	170.29	331.66
1422	0.07	0.02	3.66	0.19	0.636	4.49	165.82	331.63
1397	0.07	0.02	3.69	0.19	0.623	4.51	161.33	331.61
1372	0.07	0.02	3.72	0.20	0.611	4.52	156.83	331.58
1346	0.07	0.03	3.74	0.20	0.599	4.54	152.30	331.56
1321	0.07	0.03	3.77	0.20	0.588	4.56	147.76	331.53
1295	0.07	0.03	3.79	0.21	0.577	4.58	143.20	331.51
1270	0.07	0.03	3.81	0.21	0.567	4.59	138.63	331.48
1245	0.07	0.03	3.84	0.21	0.557	4.61	134.03	331.45
1219	0.07	0.03	3.86	0.21	0.548	4.62	129.43	331.43
1194	0.07	0.03	3.88	0.22	0.539	4.63	124.81	331.40
1168	0.07	0.03	3.90	0.22	0.531	4.65	120.18	331.38
1143	0.07	0.03	3.91	0.22	0.523	4.66	115.53	331.35
1118	0.07	0.03	3.93	0.22	0.515	4.67	110.87	331.33
1092	0.07	0.03	3.95	0.23	0.508	4.68	106.21	331.30
1067	0.07	0.03	3.96	0.23	0.501	4.69	101.53	331.28
1041	0.07	0.03	3.97	0.23	0.495	4.70	96.84	331.25
1016	0.07	0.03	3.99	0.23	0.489	4.71	92.14	331.23
991	0.07	0.03	4.01	0.23	0.480	4.72	87.43	331.20
965	0.00	0.00	0.00	0.00	2.177	2.18	82.71	331.18
940	0.00	0.00	0.00	0.00	2.177	2.18	80.53	331.15
914	0.00	0.00	0.00	0.00	2.177	2.18	78.35	331.12
889	0.00	0.00	0.00	0.00	2.177	2.18	76.18	331.10
864	0.00	0.00	0.00	0.00	2.177	2.18	74.00	331.07
838	0.00	0.00	0.00	0.00	2.177	2.18	71.82	331.05
813	0.00	0.00	0.00	0.00	2.177	2.18	69.65	331.02

13 286
Far Sight Lands
Storage Discharge Curve Delineation 204

Elevation (masl)	Head on Orifice 1 (m)	Head on Orifice 2 (m)	Stormtech Storage (m^3)	Total Storage (ham)	Q Orifice 1 (m^3/s)	Q Orifice 2 (m^3/s)	Q Total (m^3/s)
330.12	0.00	0.00	0.00	0.0000	0.000	0.000	0.000
330.15	0.00	0.00	41.88	0.0042	0.000	0.000	0.000
330.17	0.00	0.00	83.65	0.0084	0.000	0.000	0.000
330.20	0.00	0.00	125.34	0.0125	0.000	0.000	0.000
330.22	0.00	0.00	166.95	0.0167	0.000	0.000	0.000
330.25	0.00	0.00	208.47	0.0208	0.000	0.000	0.000
330.27	0.00	0.00	249.89	0.0250	0.000	0.000	0.000
330.30	0.00	0.00	291.22	0.0291	0.000	0.000	0.000
330.32	0.03	0.00	332.44	0.0332	0.001	0.000	0.001
330.35	0.05	0.00	373.55	0.0374	0.002	0.000	0.002
330.37	0.08	0.00	414.55	0.0415	0.002	0.000	0.002
330.40	0.10	0.00	455.42	0.0455	0.003	0.000	0.003
330.43	0.13	0.00	496.16	0.0496	0.004	0.000	0.004
330.45	0.15	0.03	536.77	0.0537	0.004	0.001	0.005
330.48	0.18	0.05	577.23	0.0577	0.005	0.002	0.006
330.50	0.20	0.08	617.55	0.0618	0.005	0.002	0.007
330.53	0.23	0.10	657.71	0.0658	0.005	0.003	0.008
330.55	0.25	0.13	697.71	0.0698	0.006	0.004	0.009
330.58	0.28	0.15	737.55	0.0738	0.006	0.004	0.010
330.60	0.30	0.18	777.21	0.0777	0.006	0.005	0.011
330.63	0.33	0.20	816.69	0.0817	0.007	0.005	0.012
330.65	0.36	0.23	855.98	0.0856	0.007	0.005	0.012
330.68	0.38	0.25	895.07	0.0895	0.007	0.006	0.013
330.70	0.41	0.28	933.96	0.0934	0.007	0.006	0.013
330.73	0.43	0.30	972.63	0.0973	0.008	0.006	0.014
330.76	0.46	0.33	1011.09	0.1011	0.008	0.007	0.014
330.78	0.48	0.36	1049.31	0.1049	0.008	0.007	0.015
330.81	0.51	0.38	1087.30	0.1087	0.008	0.007	0.015
330.83	0.53	0.41	1125.04	0.1125	0.009	0.007	0.016
330.86	0.56	0.43	1162.53	0.1163	0.009	0.008	0.016
330.88	0.58	0.46	1199.76	0.1200	0.009	0.008	0.017
330.91	0.61	0.48	1236.71	0.1237	0.009	0.008	0.017
330.93	0.63	0.51	1273.38	0.1273	0.009	0.008	0.018
330.96	0.66	0.53	1309.75	0.1310	0.010	0.009	0.018
330.98	0.69	0.56	1345.81	0.1346	0.010	0.009	0.019
331.01	0.71	0.58	1381.56	0.1382	0.010	0.009	0.019
331.03	0.74	0.61	1416.98	0.1417	0.010	0.009	0.019
331.06	0.76	0.63	1452.05	0.1452	0.010	0.009	0.020
331.09	0.79	0.66	1486.76	0.1487	0.011	0.010	0.020
331.11	0.81	0.69	1521.10	0.1521	0.011	0.010	0.020

13 286
Far Sight Lands

Storage Discharge Curve Delineation 204

Elevation (masl)	Head on Orifice 1 (m)	Head on Orifice 2 (m)	StormChamber Storage (m^3)	Total Storage (ham)	Q Orifice 1 (m^3/s)	Q Orifice 2 (m^3/s)	Q Total (m^3/s)
331.14	0.84	0.71	1555.05	0.1555	0.011	0.010	0.021
331.16	0.86	0.74	1588.59	0.1589	0.011	0.010	0.021
331.19	0.89	0.76	1621.70	0.1622	0.011	0.010	0.022
331.21	0.91	0.79	1654.37	0.1654	0.011	0.011	0.022
331.24	0.94	0.81	1686.56	0.1687	0.012	0.011	0.022
331.26	0.97	0.84	1718.26	0.1718	0.012	0.011	0.023
331.29	0.99	0.86	1749.44	0.1749	0.012	0.011	0.023
331.31	1.02	0.89	1780.06	0.1780	0.012	0.011	0.023
331.34	1.04	0.91	1810.09	0.1810	0.012	0.011	0.024
331.36	1.07	0.94	1839.48	0.1839	0.012	0.012	0.024
331.39	1.09	0.97	1868.19	0.1868	0.012	0.012	0.024
331.42	1.12	0.99	1896.14	0.1896	0.013	0.012	0.024
331.44	1.14	1.02	1923.24	0.1923	0.013	0.012	0.025
331.47	1.17	1.04	1949.37	0.1949	0.013	0.012	0.025
331.49	1.19	1.07	1974.30	0.1974	0.013	0.012	0.025
331.52	1.22	1.09	1997.36	0.1997	0.013	0.012	0.026
331.54	1.24	1.12	2018.78	0.2019	0.013	0.013	0.026
331.57	1.27	1.14	2039.67	0.2040	0.013	0.013	0.026
331.59	1.30	1.17	2060.16	0.2060	0.014	0.013	0.027
331.62	1.32	1.19	2080.21	0.2080	0.014	0.013	0.027
331.64	1.35	1.22	2099.60	0.2100	0.014	0.013	0.027
331.67	1.37	1.24	2118.62	0.2119	0.014	0.013	0.027
331.70	1.40	1.27	2137.65	0.2138	0.014	0.013	0.028
331.72	1.42	1.30	2156.68	0.2157	0.014	0.014	0.028
331.75	1.45	1.32	2175.70	0.2176	0.014	0.014	0.028
331.77	1.47	1.35	2194.73	0.2195	0.015	0.014	0.028
331.80	1.50	1.37	2213.76	0.2214	0.015	0.014	0.029
331.82	1.52	1.40	2232.78	0.2233	0.015	0.014	0.029
331.85	1.55	1.42	2251.81	0.2252	0.015	0.014	0.029
331.87	1.57	1.45	2270.84	0.2271	0.015	0.014	0.029
331.90	1.60	1.47	2289.86	0.2290	0.015	0.015	0.030
331.92	1.63	1.50	2308.89	0.2309	0.015	0.015	0.030
331.95	1.65	1.52	2327.92	0.2328	0.015	0.015	0.030

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

C=0.62	
Diameter of Orifice 1 = 75mm	Elevation of Orifice 1 = 330.3masl
Diameter of Orifice 2 = 75mm	Elevation of Orifice 2 =330.43masl

Project:

Chamber Model -	MC-4500	
Units -	**Metric**	Click Here for Imperial
Number of Chambers -	516	
Number of chambers -	40	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	329.79	m
Amount of Stone Above Chambers -	305	mm
Amount of Stone Below Chambers -	330	mm

Include Perimeter Stone in Calculations

StormTech MC-4500 Cumulative Storage Volumes

Height of System *(mm)*	Incremental Single Chamber *(cubic meters)*	Incremental Single End Cap *(cubic meters)*	Incremental Chambers *(cubic meters)*	Incremental End Cap *(cubic meters)*	Incremental Stone *(cubic meters)*	Incremental Chamber, End Cap and Stone *(cubic meters)*	Cumulative System *(cubic meters)*	Elevation *(meters)*
2159	0.00	0.00	0.00	0.00	19.026	19.03	2575.26	331.95
2134	0.00	0.00	0.00	0.00	19.026	19.03	2556.23	331.92
2108	0.00	0.00	0.00	0.00	19.026	19.03	2537.21	331.90
2083	0.00	0.00	0.00	0.00	19.026	19.03	2518.18	331.87
2057	0.00	0.00	0.00	0.00	19.026	19.03	2499.15	331.85
2032	0.00	0.00	0.00	0.00	19.026	19.03	2480.13	331.82
2007	0.00	0.00	0.00	0.00	19.026	19.03	2461.10	331.80
1981	0.00	0.00	0.00	0.00	19.026	19.03	2442.07	331.77
1956	0.00	0.00	0.00	0.00	19.026	19.03	2423.05	331.75
1930	0.00	0.00	0.00	0.00	19.026	19.03	2404.02	331.72
1905	0.00	0.00	0.00	0.00	19.026	19.03	2384.99	331.70
1880	0.00	0.00	0.00	0.00	19.026	19.03	2365.97	331.67
1854	0.00	0.00	0.60	0.00	18.787	19.39	2346.94	331.64
1829	0.00	0.00	1.70	0.01	18.343	20.05	2327.56	331.62
1803	0.00	0.00	2.41	0.03	18.052	20.49	2307.50	331.59
1778	0.01	0.00	3.05	0.05	17.785	20.89	2287.02	331.57
1753	0.01	0.00	3.92	0.08	17.428	21.42	2266.13	331.54
1727	0.01	0.00	6.62	0.10	16.340	23.06	2244.70	331.52
1702	0.02	0.00	9.72	0.13	15.087	24.94	2221.65	331.49
1676	0.02	0.00	11.67	0.16	14.292	26.13	2196.71	331.47
1651	0.03	0.00	13.27	0.19	13.643	27.10	2170.58	331.44
1626	0.03	0.01	14.65	0.22	13.078	27.95	2143.48	331.42
1600	0.03	0.01	15.89	0.24	12.574	28.71	2115.53	331.39
1575	0.03	0.01	17.00	0.27	12.117	29.39	2086.83	331.36
1549	0.03	0.01	18.03	0.31	11.692	30.03	2057.44	331.34
1524	0.04	0.01	18.99	0.34	11.295	30.62	2027.41	331.31
1499	0.04	0.01	19.89	0.37	10.925	31.18	1996.78	331.29
1473	0.04	0.01	20.73	0.39	10.577	31.70	1965.61	331.26
1448	0.04	0.01	21.53	0.42	10.247	32.20	1933.91	331.24
1422	0.04	0.01	22.28	0.45	9.934	32.67	1901.71	331.21
1397	0.04	0.01	23.01	0.47	9.635	33.11	1869.05	331.19
1372	0.05	0.01	23.69	0.50	9.351	33.54	1835.93	331.16
1346	0.05	0.01	24.35	0.52	9.078	33.95	1802.39	331.14
1321	0.05	0.01	24.97	0.55	8.818	34.34	1768.44	331.11
1295	0.05	0.01	25.57	0.57	8.569	34.71	1734.10	331.09
1270	0.05	0.01	26.14	0.59	8.331	35.07	1699.39	331.06
1245	0.05	0.02	26.70	0.62	8.100	35.42	1664.32	331.03
1219	0.05	0.02	27.23	0.64	7.880	35.75	1628.90	331.01
1194	0.05	0.02	27.74	0.66	7.667	36.07	1593.16	330.98
1168	0.05	0.02	28.23	0.68	7.463	36.37	1557.09	330.96
1143	0.06	0.02	28.70	0.70	7.266	36.67	1520.72	330.93
1118	0.06	0.02	29.15	0.72	7.077	36.95	1484.05	330.91
1092	0.06	0.02	29.59	0.74	6.894	37.23	1447.10	330.88
1067	0.06	0.02	30.01	0.76	6.718	37.49	1409.88	330.86
1041	0.06	0.02	30.41	0.78	6.548	37.74	1372.39	330.83
1016	0.06	0.02	30.80	0.80	6.385	37.99	1334.64	330.81
991	0.06	0.02	31.18	0.82	6.227	38.23	1296.66	330.78
965	0.06	0.02	31.54	0.84	6.074	38.45	1258.43	330.76
940	0.06	0.02	31.89	0.86	5.928	38.67	1219.97	330.73
914	0.06	0.02	32.23	0.87	5.786	38.89	1181.30	330.70
889	0.06	0.02	32.55	0.89	5.650	39.09	1142.41	330.68
864	0.06	0.02	32.86	0.91	5.519	39.29	1103.32	330.65
838	0.06	0.02	33.16	0.93	5.391	39.48	1064.04	330.63
813	0.06	0.02	33.45	0.95	5.267	39.67	1024.56	330.60
787	0.07	0.02	33.72	0.96	5.155	39.83	984.89	330.58
762	0.07	0.02	33.99	0.97	5.043	40.00	945.06	330.55
737	0.07	0.02	34.24	0.99	4.936	40.16	905.05	330.53
711	0.07	0.03	34.48	1.00	4.833	40.32	864.89	330.50
686	0.07	0.03	34.71	1.02	4.734	40.47	824.57	330.48
660	0.07	0.03	34.94	1.03	4.640	40.61	784.11	330.45
635	0.07	0.03	35.15	1.04	4.549	40.74	743.50	330.43
610	0.07	0.03	35.35	1.06	4.463	40.87	702.76	330.40
584	0.07	0.03	35.54	1.07	4.382	40.99	661.89	330.37
559	0.07	0.03	35.72	1.08	4.304	41.11	620.90	330.35
533	0.07	0.03	35.90	1.10	4.230	41.22	579.79	330.32
508	0.07	0.03	36.06	1.11	4.160	41.33	538.56	330.30
483	0.07	0.03	36.21	1.12	4.094	41.42	497.24	330.27
457	0.07	0.03	36.36	1.13	4.032	41.52	455.81	330.25
432	0.07	0.03	36.50	1.14	3.972	41.61	414.29	330.22
406	0.07	0.03	36.62	1.15	3.917	41.69	372.69	330.20
381	0.07	0.03	36.74	1.16	3.865	41.77	331.00	330.17
356	0.07	0.03	36.92	1.17	3.790	41.88	289.23	330.15
330	0.00	0.00	0.00	0.00	19.026	19.03	247.34	330.12
305	0.00	0.00	0.00	0.00	19.026	19.03	228.32	330.09
279	0.00	0.00	0.00	0.00	19.026	19.03	209.29	330.07
254	0.00	0.00	0.00	0.00	19.026	19.03	190.26	330.04
229	0.00	0.00	0.00	0.00	19.026	19.03	171.24	330.02
203	0.00	0.00	0.00	0.00	19.026	19.03	152.21	329.99
178	0.00	0.00	0.00	0.00	19.026	19.03	133.19	329.97

LID CALCULATIONS

13:286
FarSight Homes Lakeshore Road
Infiltration Gallery Sizing

Contributing Impervious Area to LID by Number of Lots

Lot Type	75%	1	0.25	Surface Drain	Impervious Lot	Road	Impervious Area
Area (m^2)	214	332	118	388	m^2	m^2	m^2
LID 1	16				3,427		3,427
LID 3		6	17		3,997	2,079	6,076
LID 4	6	15	37		10,629	8,019	18,648
LID 5	7				1,499		1,499
LID 6	4				857		857
LID 7		5	28		4,962	6,357	11,319

Impervious lot area is calculated as the product of the number of each lot type draining to the LID and the area of the roof and driveway contributing to the LID
Only LIDs 3, 4, and 7 will treat road runoff.

LID Storage Calculation

	Subcatchment ID	Percolation Rate mm/hr	Impervious Area m^2	25mm Equivalent Volume m^3	Trench Depth m	Drawdown Time hr	Width m	Length m	Contact Area m^2	Rainfall Depth mm	Storage Volume m^3	Equivalent Runoff Depth Provided mm
LID 1	204	40	3,427	86	0.74	19	1	240	240	21	71	21
LID 3	203	40	6,076	152	0.98	25	18	30	545	35	214	35
LID 4	204	40	18,648	466	0.33	8	20	97	1,940	14	256	14
LID 5	204	40	1,499	37	0.96	24	1	101	101	26	39	26
LID 6	202	16	857	21	0.38	24	1	66	66	12	10	12
LID 7	202	16	11,319	283	0.38	24	50	39	1,944	26	295	26
										Total/Average	**885**	**21**

From equation 4.2 and 4.3 in MOE 2003 SWM Design Manual:

25mm Volume = Impervious Area (m^2) * 25mm

$$T = \frac{1{,}000*d}{P}$$ Drawdown time (hr)

Where
d = Trench Depth (m)
P = Percolation Rate (mm/hr)

$$\text{Rainfall Depth} = \frac{1{,}000*V}{A}$$ Depth over impervious contributing area (mm)

$$V = \frac{APnT}{1{,}000}$$ Storage Volume (m^3)

Where
A = Contact Area Designed (m^2)
n = Average stone porosity (0.4)

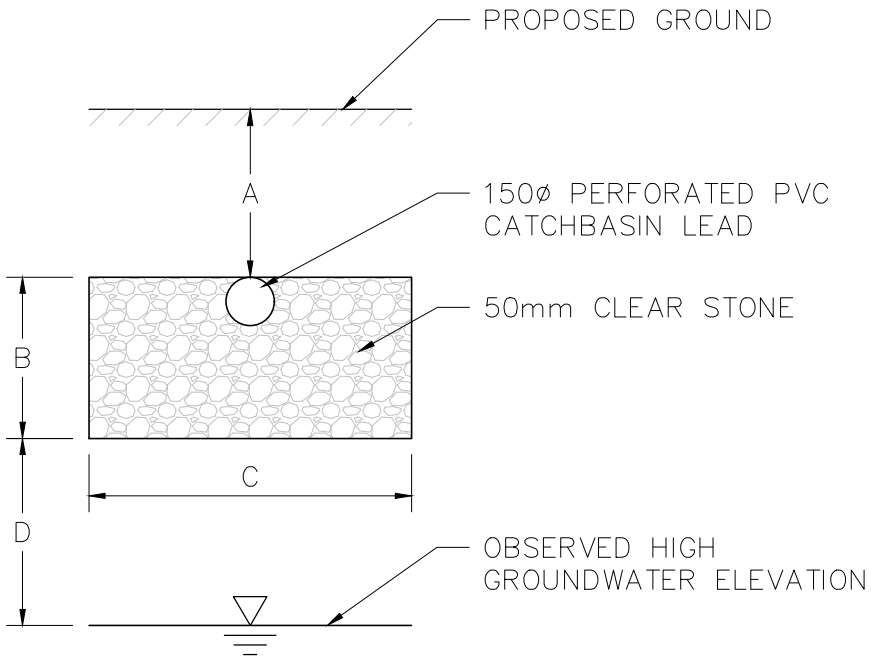
13:286
FarSight Homes Lakeshore Road
Hydrogeologic Investigation Summary

Test Pit Results

Test Pit	Depth	Infiltration Rates	Conservative Infiltration Rates by Unit	Rate with 2.5x Factor of Safety
		mm/hr	mm/hr	mm/hr
TP16-1	(1m)	118	100	40
TP16-1	(2m)	100		
TP16-2	(1m)	124		
TP16-2	(2m)	128		
TP16-3	(1m)	48	40	16
TP16-3	(2m)	58		
TP16-4	(1m)	40		
TP16-4	(2m)	40		

Groundwater Observation Wells - April 2017

	Grade	Depth	GW Elevation
	m	m	m
OW-1	328.88	0.20	328.68
OW-2	331.40	2.61	328.79
OW-3	330.10	0.89	329.21
OW-4	331.39	2.74	328.65
OW-5	334.14	2.03	332.11
OW-6	333.19	1.51	331.68



REAR YARD INFILTRATION GALLERY

SCALE: NTS

	MINIMUM COVER	DEPTH	WIDTH	MINIMUM GROUNDWATER CLEARANCE
	A	B	C	D
LID 1	1.25	0.74	1	1.85
LID 5	1.45	0.96	1	0.85
LID 6	1.45	0.38	1	1.01
LID 3	1.33	0.98	18	1.03
LID 4	0.95	0.33	20	1.03
LID 7	0.97	0.38	50	1.03

13 286
FarSight Lands
Sand Filter Sizing

Design Volume Calculation
Basic Protection Level - 55% Impervious Level
Catchment 201 is 1.80 ha
Storage requirement for Subcatchment 201 is 20m^3/ha as per Table 3.2 in the MOE SWM Guidelines

Design Volume*	43.2	m^3
Depth of Filter Media	0.5	m
Coefficient of Permeability	45.0	mm/hr
Operating head	0.2	m
Drawdown Time	24.0	hr
Contact Area	28.6	m^2

13:286
Ballantrae Lands
LID Sizing

LID	Type	Drainage Area m^2	Road m^2	Lots m^2	Impervious Area m^2	Impervious Area ha	% Impervious	25mm Equivalent Volume m^3	Infiltration Rate mm/hr	Trench Depth m	Width m	Length m	Contact Area m^2	Storage Volume m^3	Equivalent Runoff Depth Provided mm
LID 1	Rear Yard Gallery	5,317		3,427	3,427	0.34	64%	86	40	0.74	1	240	239.9	**71**	**21**
LID 3	StormTech	7,460	2,079	3,997	6,076	0.61	81%	152	40	0.98	18	30	545	**214**	**35**
LID 4	StormTech	21,975	8,019	10,629	18,648	1.86	85%	466	40	0.33	20	97	1940	**256**	**14**
LID 5	Rear Yard Gallery	1,817		1,499	1,499	0.15	83%	37	40	0.96	1	101	100.7	**39**	**26**
LID 6	Rear Yard Gallery	1,641		857	857	0.09	52%	21	16	0.38	1	66	65.7	**10**	**12**
LID 7	StormTech	18,581	6,357	4,962	11,319	1.13	61%	283	16	0.38	50	39	1944	**295**	**26**
		Total			**41,826**								**Total**	**885**	**21**

PHOSPHORUS BUDGET

Ontario

MINISTRY OF THE ENVIRONMENT

Database Version: V 2.0 Release Update
Update Date: 30-Mar-12

Project DEVELOPMENT Summary

DEVELOPMENT: FarSight Ballantrae
Subwatershed: East Holland

Total Pre-Development Area (ha):	11.170	Total Pre-Development Phosphorus Load (kg/yr):	2.90

Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	6.61	0.36	2.38
Forest	1.22	0.10	0.12
Hay-Pasture	3.13	0.12	0.38
Low Intensity Development	0.21	0.13	0.03

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency		P Load (kg/yr)
High Intensity - Residential	1.75	1.32	Sand or Media Filters	45%	1.27
High Intensity - Residential	5.86	1.32	Perforated Pipe Infiltration/Exfiltration Systems	87%	1.01
Low Intensity Development	3.48	0.13	NONE	0%	0.45
Low Intensity Development	0.08	0.13	Sand or Media Filters	45%	0.01

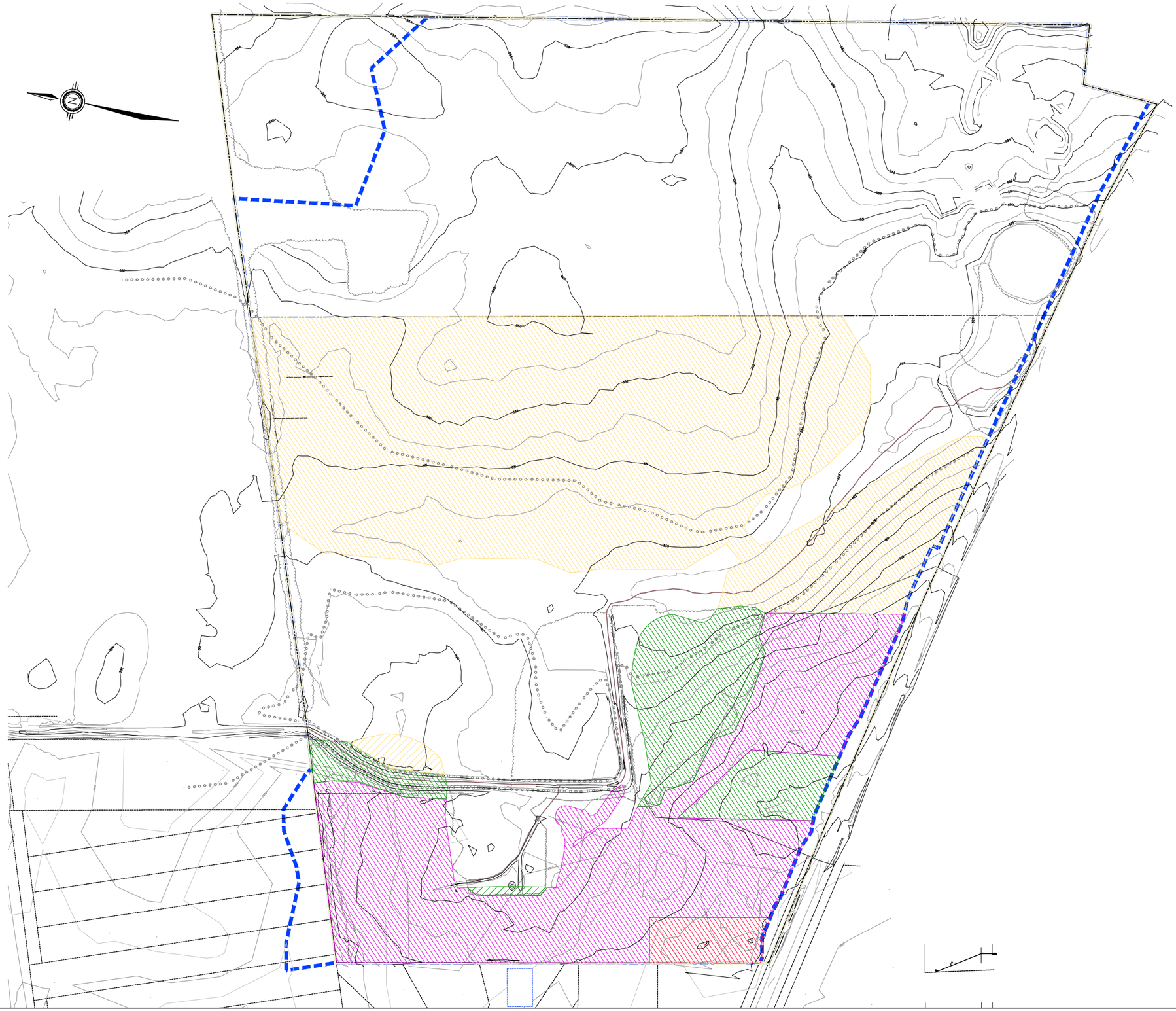
		P Load (kg/yr)
Post-Development Area Altered:	11.17	
Total Pre-Development Area:	11.17	
Unaffected Area:	0	
Pre-Development:		2.90
Post-Development:		10.51
Change (Pre - Post):		-7.60
262% Net Increase in Load		
Post-Development (with BMPs):		2.73
Change (Pre - Post):		0.17
6% Net Reduction in Load		

DEVELOPMENT: **FarSight Ballantrae**
Subwatershed: **East Holland**

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	**P Load (kg/yr)**
Pre-Development:	**2.90**
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	**2.73**
Post-Development + Amortized Construction:	**to be determined**
Pre-Development Load - Post-Development Load:	**0.17**
Conclusion:	**6% Reduction in Load**
Pre-Development Load - (Post-Development + Amortized Construction Load):	**to be determined**
Conclusion:	**to be determined**

Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:



LEGEND:

- PRE-DEVELOPMENT DRAINAGE BOUNDARY
- EXISTING REGIONAL FLOODLINE
- CROPLAND/CORN FIELD
- HAY PASTURE/POOR GRASS
- FOREST/WOODLOT
- LOW INTENSITY DEVELOPMENT/ MIXED RESIDENTIAL

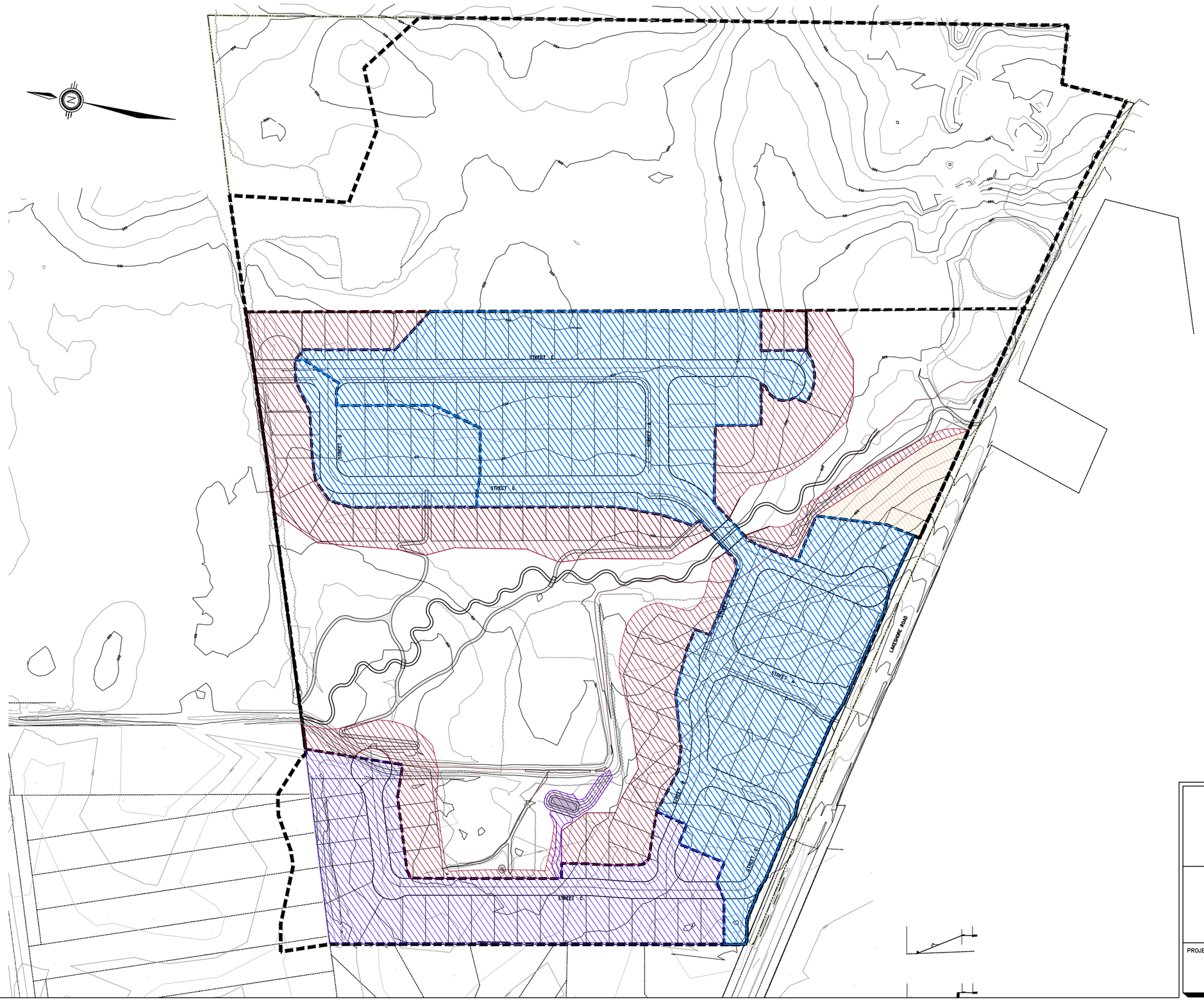
1:2500

PRE DEVELOPMENT LAND USE

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	PRE

CAD FILE: P:\13\286\Drawing Files\Phase I\Figures\3- 3rd FSSR submission\286 Fig XX Phosphorus.dwg



LEGEND:

- POST DEVELOPMENT DRAINAGE BOUNDARY
- 201 / 1.89 / 0.45 — SUBCATCHMENT ID / SUBCATCHMENT AREA (HA) / PERCENT IMPERVIOUS
- PROPOSED REGIONAL FLOODLINE
- LOW INTENSITY DEVELOPMENT SAND FILTER TREATMENT
- LOW INTENSITY DEVELOPMENT/ OPEN SPACE
- LOW INTENSITY DEVELOPMENT/ REAR LOTS DISCONNECTED
- HIGH INTENSITY DEVELOPMENT/ INFILTRATION TREATMENT
- HIGH INTENSITY DEVELOPMENT/ SAND FILTER TREATMENT

1:2500

POST DEVELOPMENT LAND USE

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	POST

CAD FILE: P:\13\286\Drawing Files\Phase I\Figures\3- 3rd FSSR submission\286 Fig XX Phosphorus.dwg

RLCB CAPTURE CALCULATIONS

13:286
Farsight Lands
Low Point CB Capture

Capture Summary

Type	Lot(s)	Q_{100} (L/s)	$Q_{capacity}$(L/s)
2xRLCB	12 & 14	191.9	**193.3**
RLCB	18	19.6	**21.6**
RLCB	21	25.2	**30.6**
RLCB	2	50.8	**52.9**
RLCB	5	63.0	**64.8**

Capture Calculations

Q_{100} to 2xRLCBs (lots 12 and 14)

Tributary Drainage Area = 1.28 ha

Runoff Coefficient = 0.31

A x R = 0.3968

T_C = 10 min

$I_{100YR} = \frac{1443.947}{(t + 5.273)^{0.776}}$

I_{100} = 174.11 mm/hr

Q_{100} = 191.91 L/s

$Q_{capacity}$ of 2xRLCB

CB Grate per OPSD 400.100

Total Open Area = 0.291 m^2 (*50% Blocked DCBs)

Calculate 100-year flow based on orifice equation: $Q = CA\sqrt{2gh}$

$Q = CA\sqrt{2gh}$

Where:

Q= Total captured flow

C= 0.67

Q= 0.1933 m^3/s

A= 0.291 m^2

Q= 193.3 L/s

g= 9.81 m/s^2

h= 0.05 m*

**head is calculated as the minimum depth of ponding that is required to meet the required flow*

Therefore, as the minimum head of 0.05m is less than the available depth, it has sufficient capacity.

13:286
Farsight Lands
Low Point CB Capture

Q_{100} to RLCB (lot 18)

Tributary Drainage Area = 0.07 ha
Runoff Coefficient = 0.58
A x R = 0.0406
T_C = 10 min

$I_{100YR} = \frac{1443.947}{(t + 5.273)^{0.776}}$

I_{100} = 174.11 mm/hr
Q_{100} = 19.64 L/s

$Q_{capacity}$ of RLCB

CB Grate per OPSD 400.100
Total Open Area = 0.073 m^2 (*50% Blocked DCB)

Calculate 100-year flow based on orifice equation: $Q = CA\sqrt{2gh}$

$Q = CA\sqrt{2gh}$

Where:
Q= Total captured flow
C= 0.67
A= 0.073 m^2
g= 9.81 m/s^2
h= 0.01 m*

Q= 0.0216 m^3/s
Q= 21.6 L/s

**head is calculated as the minimum depth of ponding that is required to meet the required flow*
Therefore, as the minimum head of 0.01m is less than the available depth, it has sufficient capacity.

Q_{100} to RLCB (lot 21)

Tributary Drainage Area = 0.09 ha
Runoff Coefficient = 0.58
A x R = 0.0522
T_C = 10 min

$I_{100YR} = \frac{1443.947}{(t + 5.273)^{0.776}}$

I_{100} = 174.11 mm/hr
Q_{100} = 25.25 L/s

$Q_{capacity}$ of RLCB

CB Grate per OPSD 400.100
Total Open Area = 0.073 m^2 (*50% Blocked)

Calculate 100-year flow based on orifice equation: $Q = CA\sqrt{2gh}$

$Q = CA\sqrt{2gh}$

Where:
Q= Total captured flow
C= 0.67
A= 0.073 m^2
g= 9.81 m/s^2
h= 0.02 m*

Q= 0.0306 m^3/s
Q= 30.6 L/s

**head is calculated as the minimum depth of ponding that is required to meet the required flow*
Therefore, as the minimum head of 0.02m is less than the available depth, it has sufficient capacity.

13:286
Farsight Lands
Low Point CB Capture

Q_{100} to RLCB (lot 2)

Tributary Drainage Area = 0.25 ha
Runoff Coefficient = 0.42
A x R = 0.105
T_C = 10 min

$I_{100YR} = \frac{1443.947}{(t + 5.273)^{0.776}}$

I_{100} = 174.11 mm/hr
Q_{100} = 50.78 L/s

$Q_{capacity}$ of RLCB

CB Grate per OPSD 400.100
Total Open Area = 0.073 m^2 (*50% Blocked)

Calculate 100-year flow based on orifice equation: $Q = CA\sqrt{2gh}$

$Q = CA\sqrt{2gh}$

Where:
Q= Total captured flow
C= 0.67
A= 0.073 m^2
g= 9.81 m/s^2
h= 0.06 m*

Q= 0.0529 m^3/s
Q= 52.9 L/s

**head is calculated as the minimum depth of ponding that is required to meet the required flow*
Therefore, as the minimum head of 0.06m is less than the available depth, it has sufficient capacity.

Q_{100} to RLCB (lot 5)

Tributary Drainage Area = 0.31 ha
Runoff Coefficient = 0.42
A x R = 0.1302
T_C = 10 min

$I_{100YR} = \frac{1443.947}{(t + 5.273)^{0.776}}$

I_{100} = 174.11 mm/hr
Q_{100} = 62.97 L/s

$Q_{capacity}$ of RLCB

CB Grate per OPSD 400.100
Total Open Area = 0.073 m^2 (*50% Blocked)

Calculate 100-year flow based on orifice equation: $Q = CA\sqrt{2gh}$

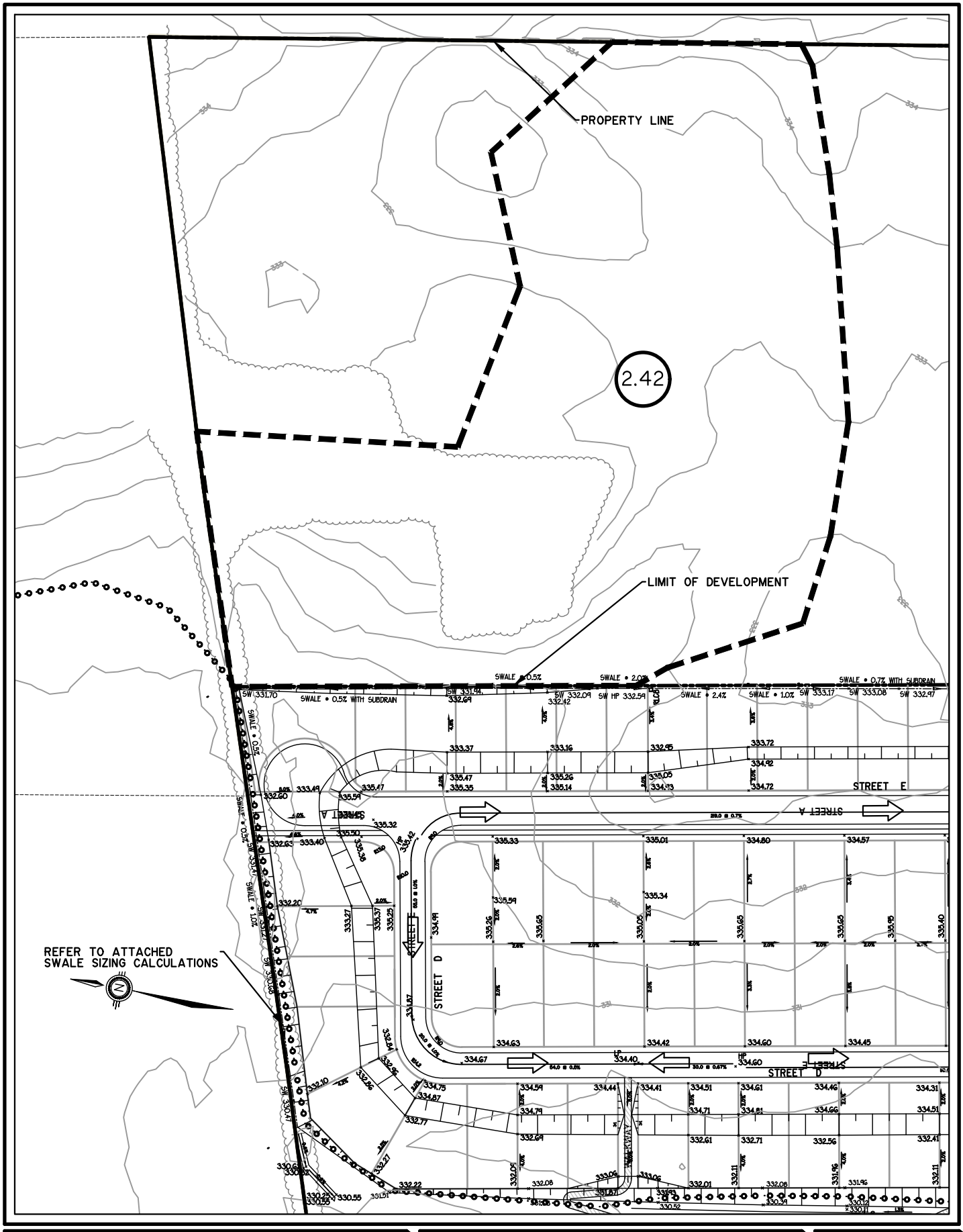
$Q = CA\sqrt{2gh}$

Where:
Q= Total captured flow
C= 0.67
A= 0.073 m^2
g= 9.81 m/s^2
h= 0.09 m*

Q= 0.0648 m^3/s
Q= 64.8 L/s

**head is calculated as the minimum depth of ponding that is required to meet the required flow*
Therefore, as the minimum head of 0.09m is less than the available depth, it has sufficient capacity.

SWALE SIZING CALCULATIONS



SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

286 FARSIGHT HOMES
SWALE SIZING FOR EXT DRAINAGE

FIGURE No.

13: 286
FarSight Lands
Drainage Area 209 VO Schematic

****
** SIMULATION:Run 12 **
****

| READ STORM | Filename: C:\Users\pcallaghan\AppD
| | ata\Local\Temp\
| | 62cb4e14-884e-411e-b7e2-3a6102082df0\9c9568e7
| Ptotal= 95.97 mm | Comments: 100-Year 12-Hour SCS II Design Storm
---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.40	3.25	3.84	6.25	17.27	9.25	3.36
0.50	2.40	3.50	3.84	6.50	17.27	9.50	3.36
0.75	2.40	3.75	3.84	6.75	7.68	9.75	3.36
1.00	2.40	4.00	3.84	7.00	7.68	10.00	3.36
1.25	2.40	4.25	5.76	7.25	5.76	10.25	1.92
1.50	2.40	4.50	5.76	7.50	5.76	10.50	1.92
1.75	2.40	4.75	7.68	7.75	5.76	10.75	1.92
2.00	2.40	5.00	7.68	8.00	5.76	11.00	1.92
2.25	2.88	5.25	11.52	8.25	3.36	11.25	1.92
2.50	2.88	5.50	11.52	8.50	3.36	11.50	1.92
2.75	2.88	5.75	46.07	8.75	3.36	11.75	1.92
3.00	2.88	6.00	126.68	9.00	3.36	12.00	1.92

| CALIB |
| NASHYD (0033)| Area (ha)= 2.42 Curve Number (CN)= 62.0
|ID= 1 DT= 1.0 min | Ia (mm)= 5.90 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.33

Unit Hyd Qpeak (cms)= 0.280

PEAK FLOW (cms)= 0.165 (i)
TIME TO PEAK (hrs)= 6.233
RUNOFF VOLUME (mm)= 33.011
TOTAL RAINFALL (mm)= 95.968
RUNOFF COEFFICIENT = 0.344

(ii) PEAK FLOW DOES NOT INCLUDE BASEFLOW

Manning's Calculator (Triangular Flow)

Input:		
Discharge	0.17	m^3/s
Depth	0.33	m
Slope	0.50%	
Manning's n	0.04	
Side Slopes	3	:1 (H:V)

Solve for: Depth

Velocity	0.52	m/s
Flow Area	0.33	m^2
Flow Top Width	1.99	m
Wetted Perimeter	2.10	m
Critical Depth	0.23	m
Critical Slope	3.44%	
Froude Number	0.40	

Job Number: **13:286:D1**
Description: **Swale capacity calulations**

APPENDIX D

HYDROLOGIC MODEL

13:286
Far Sight Lands
Upland's Method Time to Peak Calculation

Pre Development (100)

Segment	Crop Type	Grade	Velocity	Length	Time
No.		%	m/s	m	s
1	Countour/Strip Crop	1.40%	0.16	70	438
2	Countour/Strip Crop	0.86%	0.14	58	414
3	Countour/Strip Crop	0.97%	0.15	155	1033
4	Countour/Strip Crop	0.95%	0.15	105	700
5	Straight Row Crop	0.49%	0.20	77	385
6	Straight Row Crop	0.25%	0.14	102	729
7	Straight Row Crop	0.75%	0.23	135	587
8	Grassed Waterway	0.43%	0.30	174	580
9	Grassed Waterway	0.78%	0.40	64	160
				Total	5026

Tc	84	min
	1.40	hr
Tp	0.93	hours

Post Development (209)

Segment	Crop Type	Grade	Velocity	Length	Time
No.		%	m/s	m	s
1	Countour/Strip Crop	1.09%	0.15	230	1533
2	Grassed Waterway	0.70%	0.36	90	250
				Total	1783

Tc	30	minutes
	0.50	hours
Tp	0.33	hours

Post Development (205)

Segment	Crop Type	Grade	Velocity	Length	Time
No.		%	m/s	m	s
1	Countour/Strip Crop	1.09%	0.15	230	1533
2	Grassed Waterway	0.70%	0.36	226	628
3	Pasture	0.25%	0.11	125	1138
4	Grassed Waterway	0.36%	0.24	444	1850
				Total	5149

Tc	86	minutes
	1.43	hours
Tp	0.95	hours

Post Development (207)

Segment	Crop Type	Grade	Velocity	Length	Time
No.		%	m/s	m	s
1	Contour/Strip Crop	1.68%	0.18	134	744
2	Contour/Strip Crop	0.29%	0.08	86	1079
				Total	1823

Tc	30	min
	0.51	hr
Tp	0.34	hours

Post Development (208)

Segment	Crop Type	Grade	Velocity	Length	Time
No.		%	m/s	m	s
1	Nearly Bare Soil	1.00%	0.30	37	123
				Total	123

Tc	2	min
	0.03	hr
Tp	0.02	hours

LEGEND:

- PRE-DEVELOPMENT DRAINAGE BOUNDARY
- 201 / 1.89 / 0.45 — SUBCATCHMENT ID, SUBCATCHMENT AREA (HA), PERCENT IMPERVIOUS
- EXISTING REGIONAL FLOODLINE
- FLOWPATH
- 64 / 0.78 — FLOW LENGTH, SLOPE (%)

1:2500

PRE DEVELOPMENT TIME TO PEAK

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13:286	TP 1

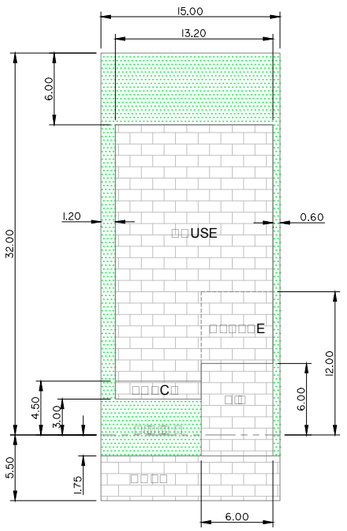
CAD FILE: P:\06\132\Drawing Files\Phase 1\Figures\132 Study Area.dwg

POST DEVELOPMENT TIME TO PEAK

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
13286	TP 2

CAD FILE: P:\06\132\Drawing Files\Phase 1\Figures\132 Study Area.dwg



□□T□□□E□

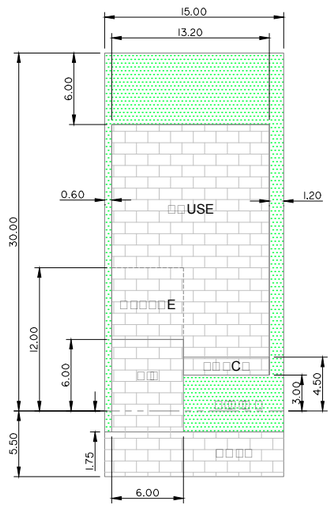
T□T□□□□E□□□I□C□□□□□ □

IM□E□□I□US□□□E□

□E□□I□US□□□E□

T□T□□□IM□E□□I□US□□I□C□□□□□ □

□□□□□□□E□□I□C□□□□□C□□



□□T□□□E□

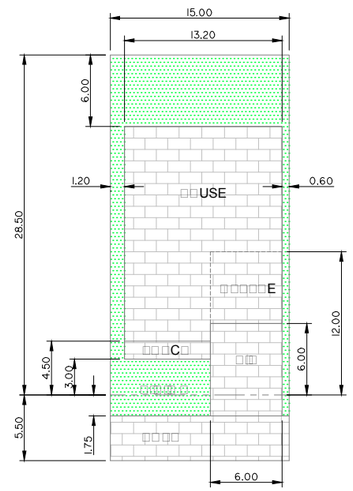
T□T□□□□E□□□I□C□□□□□ □

IM□E□□I□US□□□E□

□E□□I□US□□□E□

T□T□□□IM□E□□I□US□□I□C□□□□□ □

□□□□□□□E□□I□C□□□□□C□□



□□T□□□E□

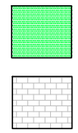
T□T□□□□E□□□I□C□□□□□ □

IM□E□□I□US□□□E□

□E□□I□US□□□E□

T□T□□□IM□E□□I□US□□I□C□□□□□ □

□□□□□□□E□□I□C□□□□□C□□



□E□□I□US□□□E□

IM□E□□I□US□□□E□

T□□IC□□□□□T□□IME□SI□□S	
□□T□□E□T□	□□T□□UMBE□
□□□	34, 35, 44, 45, 46, 47, 48, 51, 52, 53, 54, 55, 56, 60, 61
□□□□□	41, 42, 43, 50, 57, 58

NOTE: ALL LOTS HAVE 15m FRONTAGE AND 32m DEPTH, UNLESS SPECIFIED IN THE ABOVE TABLE

□□□□□

TYPICAL LOT IMPERVIOUS COVERAGE

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

□□□JECT□UMBE□
13:286

□□U□E□□□
7

CAD FILE: P:\06\132\Drawing Files\Phase 1\Figures\132 Study Area.dwg

13:286
FarSight Lands
Lot Coverage Calculation

Lot Level Evaluation - Refer to Figure 7 - Typical Lots

Lot Type	Number of Lots	Frontage	Depth	Lot	Roof	Driveway	Road	Lot plus half R.O.W.	Impervious	Pervious	Total Pervious	Total Lot Impervious	Total Impervious	TIMP
		m	m	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	m^2	
A	52	15	32.0	480.0	285.6	46.5	56.3	563	388	174	9056	17269	20194	69%
B	71	15	30.0	450.0	259.2	46.5	56.3	533	362	171	12109	21705	25698	68%
C	19	15	28.5	427.5	239.4	46.5	56.3	510	342	168	3189	5432	6501	67%
										Total	**24354**	**44406**	**52394**	**68%**

Roof Capture Impervious Breakdown

	XIMP Type (roof connection)			TIMP Type	
	100%	25%	75%	50% Exterior	50% Interior
XIMP (m^2)	332	118	261		
TIMP (m^2)	332	189		189	332

When surface draining roofs back onto open space (exterior) the back half of the roof is separate from the storm sewer catchment area.
When surface draining roofs are interior to the development, the entire roof area is assumed to contribute to the storm sewer.

Detailed Subcatchment Evaluation - Refer to Figure 6 - Stormwater Management Concept

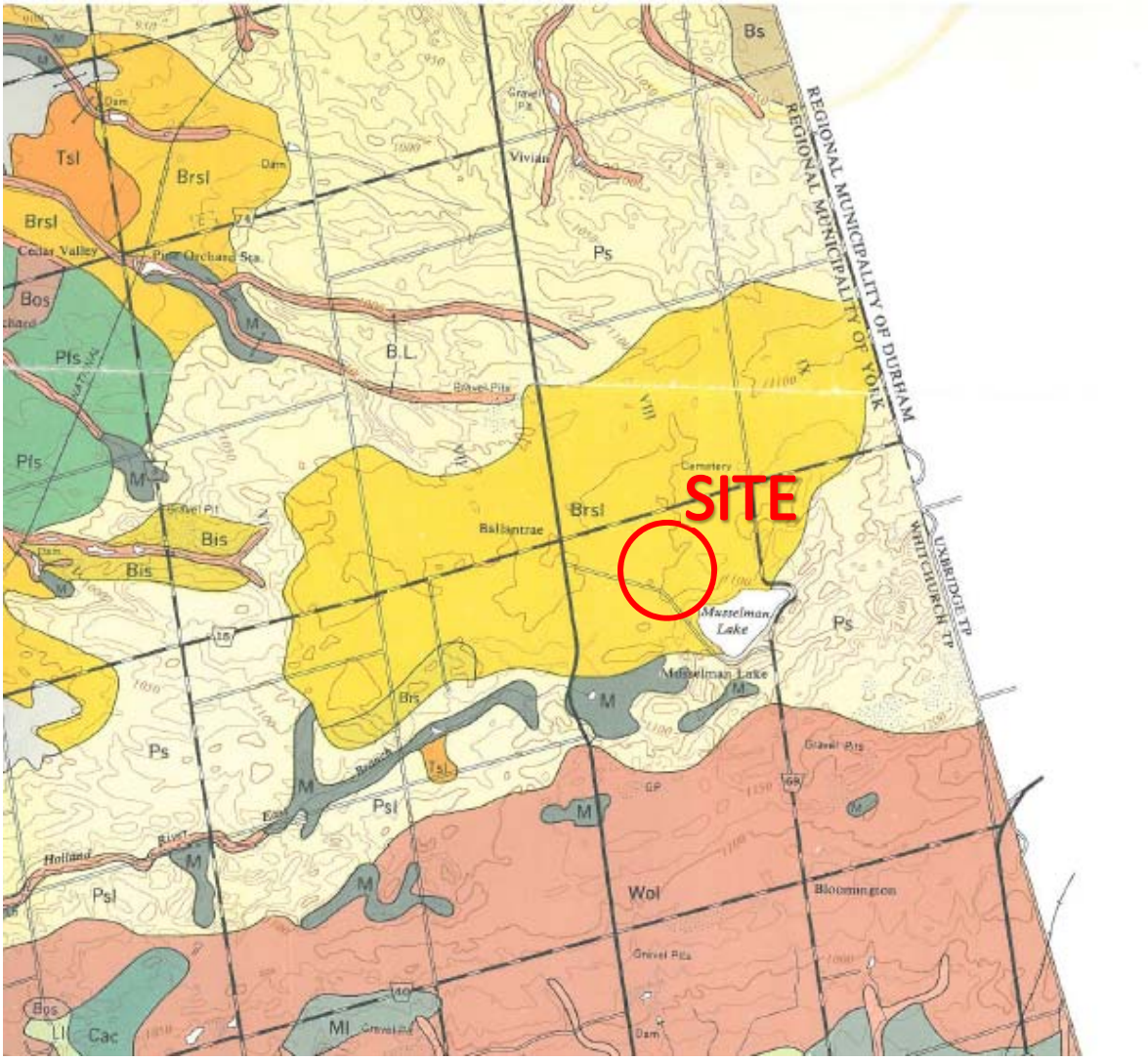
Catchment	XIMP Type (roof connection)			TIMP Type***		XIMP Lot	TIMP Lot	Road	XIMP total	TIMP total	Catchment Area	XIMP %	TIMP %
	100%	25%	75%	50% Exterior	50% Interior	m^2	m^2	m^2	m^2	m^2	m^2		
201		7	21	15	10	6300	7485	2943	9243	10428	18087	51%	58%
202	5	28	0		4	4962	8289	5268	10230	13557	22818	45%	59%
203	6	17				3997	5211	1516	5513	6727	7488	74%	90%
204	15	37	6		2	10908	12650	4819	15727	17469	31082	51%	56%
							Totals	**14546**	**40713**	**48180**			

***Assumes half of the roof area on exterior lots draining to open space will not be contributing to the storm sewer
Catchment 202, 203, and 204, drain to LID 7, LID 3, and LID 4, respectively

Road	14546	m^2
Lots	44406	m^2
Total	**58952**	m^2

Storage Volume (25mm)	**1474**	m^3

13: 286
FarSight Lands
Hydrologic Soil Map



Bsl	BRADY	sandy loam	Grey-Brown Podzolic	Imperfect
Bis	BRIDGMAN	sand	Dry sands	Excessive
Brsl	BRIGHTON	sandy loam	Grey-Brown Podzolic	Good
Brsl/g	BRIGHTON	sandy loam over gravel		
Bg	BURFORD	loam	Grey-Brown Podzolic	Good
Cac	CASHEL	clay	Grey-Brown Podzolic	Good

13: 286
FarSight Lands
Hydrologic Soil Conditions

DESIGN FLOODS FOR SMALL WATERSHEDS HYDROLOGIC SOIL CLASSIFICATION

CHART BA-I

CHART BA-1 -HYDROLOGIC SOIL GROUPS FOR AGRICULTURAL SOIL TYPES (1) (TENTATIVE)

Soil Series	Soil Type	Hyd. Soil Grp.	Soil Series	Soil Type	Hyd. Soil Grp.	Soil Series	Soil Type	Hyd. Soil Grp.
Alberton	si l	BC	Blackwell	c	C	Buzwah	c l	D
Allendale	s l	B	Blanche	si l	BC	Caledon	s l	A
Alliston	s l	AB	Blue	c l	C	Caistor	c l	C
Almonte	si c l	C	Bolingbr.	s	A	"	c	C
Ameliasbg	c l	C	Bondhead	s l	AB	Camilla	s l	AB
"	l	B	"	l	B	"	si l	BC
Ancaster	si l & s	B	Bookton	s l	AB	Campbell	si c	C
"	si l	BC	Boomer	l	B	Cane	si l	BC
Anstruther	s	A	Brady	s l	AB	"	si c l	C
Appleton	si l & s	B	Brant	s &si l	B	Carp	c &c l	C
Atherley	c	C	Brantford	si l	BC	Casey	si l	BC
"	si c l	C	"	si c l	C	Cashel	c	D
Athol	s l	A	"	c l	D	Castor	s l	AB
Atwood	c	C	Brentha	s l	A	"	si l	BC
Ayr	s l	B	"	l	B	Chesley	si l	BC
Bainsville	s	B	Brethour	si l	BC	"	si c l	C
"	si l	B	Breypen	limest.	B	"	c l	C
Balderson	s l	B	Bridgman	s	A	Chinguac.	l	BC
Bamford	s	AB	Brighton	s	A	"	si l	BC
Bancroft	s	A	"	s l	AB	"	c l	C
"	s l	B	[illegible]	s g	AB	"	c	D
Bass	c	D	Brockport	c	D	Christy	s l	B
Bastard	s	A	Brooke	l	B	Clyde	l	BC
Battersea	si l	BC	Brookston	s l	B	"	si l	BC
"	s l	AB	"	l	C	"	c l	C
Bearbrook	s l	B	"	si l	C	"	c	C
"	si c l	C	"	si c l	C	Colborne	s	A
"	c	C	"	c l	C	Colwood	s l	B
Belmeade	m & c	B	"	c	C	"	si l	B
Bennington	s l	B	Bucke	s	AB	Codrington	si l	BC
"	si l	A	"	s l	AB	Conestogo	l	BC
Berrien	s	AB	Burford	s l	A	Conover	c l	C
"	s l	AB	"	l	AB	"	l	BC
Berriedale	s & si	AB	Burnbrae	l	B	Cooksville	c	D
Beverly	l	BC	Burnstown	l	B	Coutts	s l	AB
"	si l	C	Burpee	s	A	"	l	BC
"	si c l	C	Burris	c l	C	Craigleith	c	C
Binbrook	si l	C	Buzwah	si c l	C	Cramahe	s g	A

Notes: 1. See footnotes to Chart B2-1

Sandy loam A B
sandy gravel A

2. For later additions see supplementary list at end.

3. Key to abbreviations: c - clay; f - fine; g - gravel; l - loam; ma - marl; m - muck; p - peat; r - rock; s - sand; si - silt.

13 286

FarSight Lands **CN and CN* Calculation**

(Pre Development)

Subcatchment 100 (25.50 ha)

Land Use	Area (m^2)	% of Total	CN	Weighted CN	IA	Weighted IA	USDA Land Use Description
Cornfield	153138	60%	69.0	41.4	5.0	3.0	C+CR crop residue and countoured.
Woodlot	32916	13%	48.0	6.2	10.0	1.3	Fair condition woods AB
Mixed Residential	25507	10%	57.1	5.7	2.5	0.3	Mowed grass in good condition ~85% cover
Trees and Pond	10134	4%	55.6	2.2	5.0	0.2	Woods in good condition, forest litter not removed, 23% pond cover
Poor Grass	33273	13%	73.5	9.6	3.0	0.4	Poor condition, exposed soil and low cover grass, unkempt, tire tracks
Total	**254968**	**Weighted Average**		**65.149**		**5.1**	

(Post Development)

Subcatchment 205 (16.06 ha)

Land Use	Area (m^2)	% of Total	CN	Weighted CN	IA	Weighted IA	USDA Land Use Description
Cornfield	51055	32%	69.0	21.9	5.0	1.6	C+CR crop residue and countoured.
Meadow	30985	19%	44.0	8.5	8.0	1.5	Continuous grass protected from grazing and generally mowed for hay
Woodlot	21083	13%	48.0	6.3	10.0	1.3	Fair condition woods AB
Rear Lots Disconnected	23652	15%	93.0	13.7	2.3	0.3	75% of roof to rear yard at CN=98 and grass at CN=50
Mixed Residential	18813	12%	57.1	6.7	2.5	0.3	Mowed grass in good condition ~85% cover
Trees and Pond	10134	6%	55.6	3.5	5.0	0.3	Woods in good condition, forest litter not removed, 23% pond cover
Open Space	3021	2%	50.0	0.9	5.0	0.1	Good condition (grass cover > 75%)
Poor Grass	2377	1%	73.5	1.1	3.0	0.0	Poor condition, exposed soil and low cover grass, unkempt, tire tracks
Total	**161120**	**Weighted Average**		**62.4**		**5.5**	

Subcatchment 207 (1.43 ha)

Land Use	Area (m^2)	% of Total	CN	Weighted CN	IA	Weighted IA	USDA Land Use Description
Cornfield	14320	100%	69.0	69.0	5.0	5.0	C+CR crop residue and countoured.
Total	**14320**	**Weighted Average**		**69.0**		**5.0**	

Subcatchment 208 (0.27 ha)

Land Use	Area (m^2)	% of Total	CN	Weighted CN	IA	Weighted IA	USDA Land Use Description
Poor Grass	2662	100%	73.5	73.5	3.0	3.0	Poor condition, exposed soil and low cover grass, unkempt, tire tracks
Total	**2662**	**Weighted Average**		**73.5**		**3.0**	

Subcatchment 209 (2.42 ha)

Land Use	Area (m^2)	% of Total	CN	Weighted CN	IA	Weighted IA	USDA Land Use Description
Cornfield	19371	80%	69.0	55.3	5.0	4.0	C+CR crop residue and countoured.
Woodlot	4801	20%	48.0	9.5	10.0	2.0	Fair condition woods AB
Total	**24172**	**Weighted Average**		**64.8**		**6.0**	

Subcatchment 210 (0.08 ha)

Land Use	Area (m^2)	% of Total	CN	Weighted CN	IA	Weighted IA	USDA Land Use Description
Rear Lots Disconnected	774	100%	93.0	93.0	2.3	2.3	75% of roof to rear yard at CN=98 and grass at CN=50
Total	**774**	**Weighted Average**		**93.0**		**2.3**	

Subcatchment 201-204 (7.66 ha)

Land Use	Area (m^2)	% of Total	CN	Weighted CN	IA	Weighted IA	USDA Land Use Description
Residential	76570	100%	59.0	59.0	1.5	1.5	Open space/lawns in fair condition AB soil
Total	**76570**	**Weighted Average**		**59.0**		**1.5**	

Modified Curve Number Calculation

Subcatchment ID	CN2	IA	CN3	P	S	IA*	Q	S*	CN3*	CN2*
100	65.1	5.2	81.13	95.97	59.08	8.86	51.91	67.96	78.89	62
205	62.4	5.5	79.27	95.97	66.42	6.64	51.24	69.25	78.58	61
207	69.0	5.0	83.66	95.97	49.62	7.44	56.73	54.90	82.23	67
208	73.5	3.0	86.45	95.97	39.82	5.97	62.39	45.56	84.79	71
209	64.8	6.0	80.91	95.97	59.91	8.99	51.51	67.21	79.08	62
210	93.0	2.3	96.83	95.97	8.31	1.25	87.08	7.09	97.29	94
201-204	59.0	1.5	76.80	95.97	76.74	11.51	44.25	107.21	70.32	51

13 286
FarSight Lands
Visual OTTHYMO Input and Output Summary

Pre Development Input

Input Parameter	100
DT (min)	5
Area (ha)	25.5
CN	62
IA	5
TP (hr)	0.93
TIMP	-
XIMP	-
SLPP (%)	-
LGP (m)	-
MNP	-
SLPI (%)	-
LGI (m)	-
MNI	-

Pre Development Peak Flow at Catchment Outlet

	Peak Flow (m^3/s)	
Storm	12 Hour SCS	4 Hour Chicago
2 Year	0.19	0.13
5 Year	0.33	0.24
10 Year	0.46	0.33
25 Year	0.60	0.43
50 Year	0.71	0.56
100 Year	0.83	0.68

Post Development Input

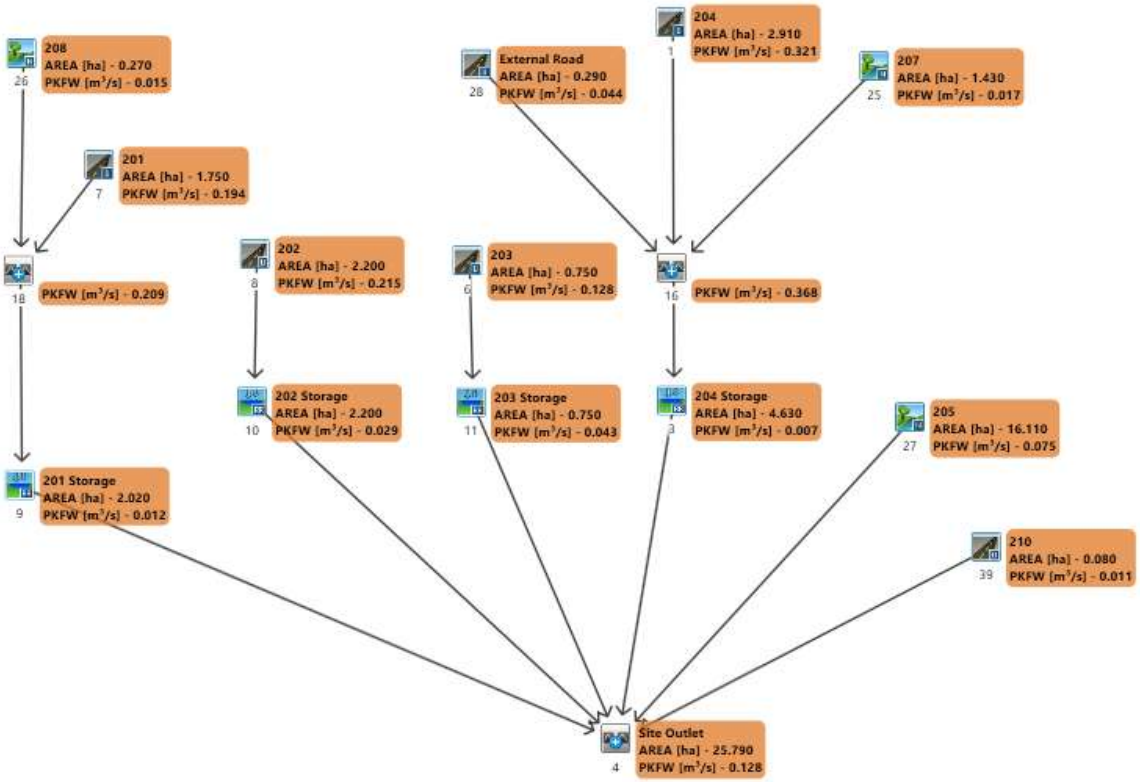
Input Parameter	205	207	208	209	210	201	202	203	204	External Road
Description	Internal Woodland, Channel	External Drainage North	External Drainage Southwest	External Drainage Northeast (included in 205)	Uncontrolled Rear lots Southeast	Res. Block South	Res. Block Southeast	Res. Block Northwest	Res. Block North	External Road Northeast
DT (min)	1									
Area (ha)	16.11	1.37	0.27	2.42	0.08	1.81	2.18	0.75	2.92	0.29
CN*	60	67	71	60	94	47				
IA	5.6	5.0	3.0	5.6	2.3	1.5				
TP (hr)	0.95	0.34	0.02	0.28	-					
TIMP	-				0.50	0.58	0.59	0.90	0.56	0.67
XIMP	-				0.35	0.51	0.45	0.74	0.51	0.67
SLPP (%)	-				2					
LGP (m)	-				40					
MNP	-				0.25					
SLPI (%)	-				1					
LGI (m)	-				23.09	109.54	129.87	73.03	141.66	43.97
MNI	-				0.013					

Post Development Peak Flow at Catchment Outlet

	Peak Flow (m^3/s)	
Storm	12 Hour SCS	4 Hour Chicago
2 Year	0.18	0.13
5 Year	0.30	0.23
10 Year	0.43	0.31
25 Year	0.58	0.38
50 Year	0.67	0.52
100 Year	0.75	0.68

13: 286
FarSight Lands
Pre Development VO Schematic

13: 286
FarSight Lands
Post Development VO Schematic



```
  ********************************************
  ** SIMULATION : Run 01                     **
  ********************************************
  2 YEAR 4 HOUR CHICAGO
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 647.700
| Ptotal= 34.80 mm |                          B=   4.000
--------------------                          C=   0.784
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	2.27	1.17	17.17	2.17	5.25	3.17	2.69
0.33	2.59	1.33	81.81	2.33	4.49	3.33	2.50
0.50	3.04	1.50	22.50	2.50	3.93	3.50	2.34
0.67	3.72	1.67	11.86	2.67	3.51	3.67	2.20
0.83	4.86	1.83	8.23	2.83	3.18	3.83	2.08
1.00	7.29	2.00	6.38	3.00	2.91	4.00	1.98

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  27.12   Curve Number   (CN)= 62.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.94

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

```
     Unit Hyd Qpeak  (cms)=   1.102

     PEAK FLOW       (cms)=   0.137 (i)
     TIME TO PEAK    (hrs)=   2.583
     RUNOFF VOLUME    (mm)=   4.788
     TOTAL RAINFALL   (mm)=  34.800
     RUNOFF COEFFICIENT   =   0.138

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

--------------------------------------------------------------------------------
  ***********************************************
  ** SIMULATION : Run 02                       **
  ***********************************************
  5 YEAR 4 HOUR CHICAGO
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 929.800
| Ptotal= 46.26 mm |                          B=   4.000
--------------------                          C=   0.798
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    2.85 |  1.17   22.78 |  2.17    6.71 |  3.17    3.38
                0.33    3.26 |  1.33  113.18 |  2.33    5.71 |  3.33    3.14
                0.50    3.84 |  1.50   30.05 |  2.50    4.99 |  3.50    2.94
                0.67    4.71 |  1.67   15.53 |  2.67    4.45 |  3.67    2.76
                0.83    6.21 |  1.83   10.66 |  2.83    4.02 |  3.83    2.60
                1.00    9.42 |  2.00    8.20 |  3.00    3.67 |  4.00    2.47


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  27.12   Curve Number   (CN)= 62.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.94

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.85 | 1.083   22.78 | 2.083    6.71 |  3.08    3.38
               0.167    2.85 | 1.167   22.78 | 2.167    6.71 |  3.17    3.38
```

0.250	3.26	1.250	113.18	2.250	5.71	3.25	3.14
0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.60
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.60
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.255 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 8.643
TOTAL RAINFALL (mm)= 46.257
RUNOFF COEFFICIENT = 0.187

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

****
** SIMULATION : Run 03 **
****

10 YEAR 4 HOUR CHICAGO

CHICAGO STORM
Ptotal= 54.13 mm

IDF curve parameters: A=1021.000
B= 3.000
C= 0.787
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.43	1.17	25.32	2.17	7.85	3.17	4.06
0.33	3.92	1.33	135.63	2.33	6.73	3.33	3.78
0.50	4.59	1.50	33.17	2.50	5.91	3.50	3.54
0.67	5.59	1.67	17.50	2.67	5.29	3.67	3.33
0.83	7.28	1.83	12.21	2.83	4.79	3.83	3.15
1.00	10.84	2.00	9.50	3.00	4.39	4.00	2.99

CALIB NASHYD (0002)	Area (ha)= 27.12	Curve Number (CN)= 62.0

```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.94

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

```
     Unit Hyd Qpeak  (cms)=   1.102

     PEAK FLOW       (cms)=   0.349 (i)
     TIME TO PEAK    (hrs)=   2.500
     RUNOFF VOLUME    (mm)=  11.787
     TOTAL RAINFALL   (mm)=  54.135
     RUNOFF COEFFICIENT   =   0.218

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

--------------------------------------------------------------------------------
  **********************************************
  ** SIMULATION : Run 04                       **
  **********************************************
  25 YEAR 4 HOUR CHICAGO
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1100.000
| Ptotal= 62.15 mm |                          B=   2.000
--------------------                          C=   0.776
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	4.06	1.17	27.34	2.17	9.00	3.17	4.78

0.33	4.62	1.33	159.94	2.33	7.77	3.33	4.46
0.50	5.38	1.50	35.45	2.50	6.86	3.50	4.19
0.67	6.51	1.67	19.27	2.67	6.16	3.67	3.95
0.83	8.38	1.83	13.70	2.83	5.61	3.83	3.74
1.00	12.24	2.00	10.80	3.00	5.16	4.00	3.55

CALIB			
NASHYD (0002)	Area (ha)=	27.12	Curve Number (CN)= 62.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.94	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	4.06	1.083	27.34	2.083	9.00	3.08	4.78
0.167	4.06	1.167	27.34	2.167	9.00	3.17	4.78
0.250	4.62	1.250	159.94	2.250	7.77	3.25	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.454 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 15.348
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.247

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

****
** SIMULATION : Run 05 **
****
50 YEAR 4 HOUR CHICAGO

CHICAGO STORM	IDF curve parameters: A=1448.000

Ptotal= 70.32 mm

B= 3.000
C= 0.803

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	4.16	1.17	32.64	2.17	9.72	3.17	4.94
0.33	4.76	1.33	184.62	2.33	8.29	3.33	4.59
0.50	5.60	1.50	43.10	2.50	7.26	3.50	4.29
0.67	6.86	1.67	22.23	2.67	6.47	3.67	4.03
0.83	9.00	1.83	15.32	2.83	5.85	3.83	3.81
1.00	13.56	2.00	11.84	3.00	5.35	4.00	3.61

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

Area (ha)= 27.12 Curve Number (CN)= 62.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.94

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.590 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 19.304
TOTAL RAINFALL (mm)= 70.316

RUNOFF COEFFICIENT = 0.275

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

****
** SIMULATION : Run 06 **
****

100 YEAR 4 HOUR CHICAGO

CHICAGO STORM	IDF curve parameters: A=1770.000
Ptotal= 78.03 mm	B= 4.000
	C= 0.820

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	4.34	1.17	38.21	2.17	10.60	3.17	5.19
0.33	5.00	1.33	203.31	2.33	8.96	3.33	4.81
0.50	5.92	1.50	50.96	2.50	7.78	3.50	4.48
0.67	7.33	1.67	25.51	2.67	6.90	3.67	4.20
0.83	9.77	1.83	17.18	2.83	6.21	3.83	3.96
1.00	15.10	2.00	13.06	3.00	5.65	4.00	3.74

CALIB	
NASHYD (0002)	Area (ha)= 27.12 Curve Number (CN)= 62.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.94

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.250	5.00	1.250	203.30	2.250	8.96	3.25	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20

0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.727 (i)
TIME TO PEAK (hrs)= 2.417
RUNOFF VOLUME (mm)= 23.318
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.299

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

****
** SIMULATION : Run 07 **
****

READ STORM	Filename: C:\Users\noconnor.SKAENG\AppData\Local\Temp\6d855ddb-cc48-438b-b3f9-a531d90d953e\41490e84
Ptotal= 44.51 mm	Comments: 2-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.11	3.25	1.78	6.25	8.01	9.25	1.56
0.50	1.11	3.50	1.78	6.50	8.01	9.50	1.56
0.75	1.11	3.75	1.78	6.75	3.56	9.75	1.56
1.00	1.11	4.00	1.78	7.00	3.56	10.00	1.56
1.25	1.11	4.25	2.67	7.25	2.67	10.25	0.89
1.50	1.11	4.50	2.67	7.50	2.67	10.50	0.89
1.75	1.11	4.75	3.56	7.75	2.67	10.75	0.89
2.00	1.11	5.00	3.56	8.00	2.67	11.00	0.89
2.25	1.34	5.25	5.34	8.25	1.56	11.25	0.89
2.50	1.34	5.50	5.34	8.50	1.56	11.50	0.89
2.75	1.34	5.75	21.36	8.75	1.56	11.75	0.89
3.00	1.34	6.00	58.75	9.00	1.56	12.00	0.89

CALIB NASHYD (0002) ID= 1 DT= 5.0 min	Area (ha)= 27.12	Curve Number (CN)= 62.0
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.94	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.500	1.11	3.500	1.78	6.500	8.01	9.50	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.500	1.34	5.500	5.34	8.500	1.56	11.50	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.750	1.34	5.750	21.37	8.750	1.56	11.75	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
3.000	1.34	6.000	58.75	9.000	1.56	12.00	0.89

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.203 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 7.998
TOTAL RAINFALL (mm)= 44.510
RUNOFF COEFFICIENT = 0.180

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

****
** SIMULATION : Run 08 **
****

READ STORM	Filename: C:\Users\noconnor.SKAENG\AppData\Local\Temp\6d855ddb-cc48-438b-b3f9-a531d90d953e\751c12f9
Ptotal= 58.27 mm	Comments: 5-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.46	3.25	2.33	6.25	10.49	9.25	2.04
0.50	1.46	3.50	2.33	6.50	10.49	9.50	2.04
0.75	1.46	3.75	2.33	6.75	4.66	9.75	2.04
1.00	1.46	4.00	2.33	7.00	4.66	10.00	2.04
1.25	1.46	4.25	3.50	7.25	3.50	10.25	1.17
1.50	1.46	4.50	3.50	7.50	3.50	10.50	1.17
1.75	1.46	4.75	4.66	7.75	3.50	10.75	1.17
2.00	1.46	5.00	4.66	8.00	3.50	11.00	1.17
2.25	1.75	5.25	6.99	8.25	2.04	11.25	1.17
2.50	1.75	5.50	6.99	8.50	2.04	11.50	1.17
2.75	1.75	5.75	27.97	8.75	2.04	11.75	1.17
3.00	1.75	6.00	76.92	9.00	2.04	12.00	1.17

CALIB			
NASHYD (0002)	Area (ha)= 27.12	Curve Number (CN)= 62.0	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.94		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.500	1.46	3.500	2.33	6.500	10.49	9.50	2.04

0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
2.000	1.46	5.000	4.66	8.000	3.50	11.00	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.500	1.75	5.500	6.99	8.500	2.04	11.50	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.750	1.75	5.750	27.97	8.750	2.04	11.75	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
3.000	1.75	6.000	76.92	9.000	2.04	12.00	1.17

```
     Unit Hyd Qpeak  (cms)=   1.102

     PEAK FLOW       (cms)=   0.351 (i)
     TIME TO PEAK    (hrs)=   6.917
     RUNOFF VOLUME    (mm)=  13.581
     TOTAL RAINFALL   (mm)=  58.270
     RUNOFF COEFFICIENT   =   0.233

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

--------------------------------------------------------------------------------
  ********************************************
  ** SIMULATION : Run 09                     **
  ********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\noconnor.SKAENG\AppD
|                  |              ata\Local\Temp\
```

| | 6d855ddb-cc48-438b-b3f9-a531d90d953e\f24b7e6f
| Ptotal= 68.87 mm | Comments: 10-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.72	3.25	2.75	6.25	12.40	9.25	2.41
0.50	1.72	3.50	2.75	6.50	12.40	9.50	2.41
0.75	1.72	3.75	2.75	6.75	5.51	9.75	2.41
1.00	1.72	4.00	2.75	7.00	5.51	10.00	2.41
1.25	1.72	4.25	4.13	7.25	4.13	10.25	1.38
1.50	1.72	4.50	4.13	7.50	4.13	10.50	1.38
1.75	1.72	4.75	5.51	7.75	4.13	10.75	1.38
2.00	1.72	5.00	5.51	8.00	4.13	11.00	1.38
2.25	2.07	5.25	8.26	8.25	2.41	11.25	1.38
2.50	2.07	5.50	8.26	8.50	2.41	11.50	1.38
2.75	2.07	5.75	33.06	8.75	2.41	11.75	1.38
3.00	2.07	6.00	90.91	9.00	2.41	12.00	1.38

CALIB	
NASHYD (0002)	Area (ha)= 27.12 Curve Number (CN)= 62.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.94

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.500	1.72	3.500	2.75	6.500	12.40	9.50	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38

1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
2.000	1.72	5.000	5.51	8.000	4.13	11.00	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.500	2.07	5.500	8.26	8.500	2.41	11.50	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.750	2.07	5.750	33.06	8.750	2.41	11.75	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
3.000	2.07	6.000	90.91	9.000	2.41	12.00	1.38

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.484 (i)
TIME TO PEAK (hrs)= 6.917
RUNOFF VOLUME (mm)= 18.579
TOTAL RAINFALL (mm)= 68.867
RUNOFF COEFFICIENT = 0.270

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

****
** SIMULATION : Run 10 **
****

READ STORM	Filename: C:\Users\noconnor.SKAENG\AppData\Local\Temp\6d855ddb-cc48-438b-b3f9-a531d90d953e\c37e24c1
Ptotal= 79.86 mm	Comments: 25-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.00	3.25	3.19	6.25	14.37	9.25	2.80
0.50	2.00	3.50	3.19	6.50	14.37	9.50	2.80
0.75	2.00	3.75	3.19	6.75	6.39	9.75	2.80
1.00	2.00	4.00	3.19	7.00	6.39	10.00	2.80
1.25	2.00	4.25	4.79	7.25	4.79	10.25	1.60
1.50	2.00	4.50	4.79	7.50	4.79	10.50	1.60
1.75	2.00	4.75	6.39	7.75	4.79	10.75	1.60

2.00	2.00	5.00	6.39	8.00	4.79	11.00	1.60
2.25	2.40	5.25	9.58	8.25	2.80	11.25	1.60
2.50	2.40	5.50	9.58	8.50	2.80	11.50	1.60
2.75	2.40	5.75	38.33	8.75	2.80	11.75	1.60
3.00	2.40	6.00	105.42	9.00	2.80	12.00	1.60

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

Area (ha)= 27.12 Curve Number (CN)= 62.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.94

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.500	2.00	3.500	3.19	6.500	14.37	9.50	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.80
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.500	2.40	5.500	9.58	8.500	2.80	11.50	1.60

2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.750	2.40	5.750	38.33	8.750	2.80	11.75	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60
3.000	2.40	6.000	105.41	9.000	2.80	12.00	1.60

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.637 (i)
TIME TO PEAK (hrs)= 6.917
RUNOFF VOLUME (mm)= 24.308
TOTAL RAINFALL (mm)= 79.860
RUNOFF COEFFICIENT = 0.304

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

****
** SIMULATION : Run 11 **
****

READ STORM	Filename: C:\Users\noconnor.SKAENG\AppData\Local\Temp\6d855ddb-cc48-438b-b3f9-a531d90d953e\3a4df615
Ptotal= 87.91 mm	Comments: 50-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.20	3.25	3.52	6.25	15.82	9.25	3.08
0.50	2.20	3.50	3.52	6.50	15.82	9.50	3.08
0.75	2.20	3.75	3.52	6.75	7.03	9.75	3.08
1.00	2.20	4.00	3.52	7.00	7.03	10.00	3.08
1.25	2.20	4.25	5.27	7.25	5.27	10.25	1.76
1.50	2.20	4.50	5.27	7.50	5.27	10.50	1.76
1.75	2.20	4.75	7.03	7.75	5.27	10.75	1.76
2.00	2.20	5.00	7.03	8.00	5.27	11.00	1.76
2.25	2.64	5.25	10.55	8.25	3.08	11.25	1.76
2.50	2.64	5.50	10.55	8.50	3.08	11.50	1.76
2.75	2.64	5.75	42.20	8.75	3.08	11.75	1.76
3.00	2.64	6.00	116.04	9.00	3.08	12.00	1.76

CALIB			
NASHYD (0002)	Area (ha)= 27.12	Curve Number (CN)= 62.0	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	

---------- U.H. Tp(hrs)= 0.94

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.20	3.083	3.52	6.083	15.82	9.08	3.08
0.167	2.20	3.167	3.52	6.167	15.82	9.17	3.08
0.250	2.20	3.250	3.52	6.250	15.82	9.25	3.08
0.333	2.20	3.333	3.52	6.333	15.82	9.33	3.08
0.417	2.20	3.417	3.52	6.417	15.82	9.42	3.08
0.500	2.20	3.500	3.52	6.500	15.82	9.50	3.08
0.583	2.20	3.583	3.52	6.583	7.03	9.58	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.500	2.20	4.500	5.27	7.500	5.27	10.50	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
2.000	2.20	5.000	7.03	8.000	5.27	11.00	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.500	2.64	5.500	10.55	8.500	3.08	11.50	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.750	2.64	5.750	42.20	8.750	3.08	11.75	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
3.000	2.64	6.000	116.04	9.000	3.08	12.00	1.76

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.758 (i)
TIME TO PEAK (hrs)= 6.917
RUNOFF VOLUME (mm)= 28.811

TOTAL RAINFALL (mm)= 87.910
RUNOFF COEFFICIENT = 0.328

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

****
** SIMULATION : Run 12 **
****

READ STORM	Filename: C:\Users\noconnor.SKAENG\AppData\Local\Temp\6d855ddb-cc48-438b-b3f9-a531d90d953e\9c9568e7
Ptotal= 95.97 mm	Comments: 100-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.40	3.25	3.84	6.25	17.27	9.25	3.36
0.50	2.40	3.50	3.84	6.50	17.27	9.50	3.36
0.75	2.40	3.75	3.84	6.75	7.68	9.75	3.36
1.00	2.40	4.00	3.84	7.00	7.68	10.00	3.36
1.25	2.40	4.25	5.76	7.25	5.76	10.25	1.92
1.50	2.40	4.50	5.76	7.50	5.76	10.50	1.92
1.75	2.40	4.75	7.68	7.75	5.76	10.75	1.92
2.00	2.40	5.00	7.68	8.00	5.76	11.00	1.92
2.25	2.88	5.25	11.52	8.25	3.36	11.25	1.92
2.50	2.88	5.50	11.52	8.50	3.36	11.50	1.92
2.75	2.88	5.75	46.07	8.75	3.36	11.75	1.92
3.00	2.88	6.00	126.68	9.00	3.36	12.00	1.92

CALIB		
NASHYD (0002)	Area (ha)= 27.12	Curve Number (CN)= 62.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.94	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.40	3.083	3.84	6.083	17.27	9.08	3.36
0.167	2.40	3.167	3.84	6.167	17.27	9.17	3.36
0.250	2.40	3.250	3.84	6.250	17.27	9.25	3.36
0.333	2.40	3.333	3.84	6.333	17.27	9.33	3.36

0.417	2.40	3.417	3.84	6.417	17.27	9.42	3.36
0.500	2.40	3.500	3.84	6.500	17.27	9.50	3.36
0.583	2.40	3.583	3.84	6.583	7.68	9.58	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
1.000	2.40	4.000	3.84	7.000	7.68	10.00	3.36
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
2.000	2.40	5.000	7.68	8.000	5.76	11.00	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.500	2.88	5.500	11.52	8.500	3.36	11.50	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.750	2.88	5.750	46.07	8.750	3.36	11.75	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
3.000	2.88	6.000	126.68	9.000	3.36	12.00	1.92

Unit Hyd Qpeak (cms)= 1.102

PEAK FLOW (cms)= 0.886 (i)
TIME TO PEAK (hrs)= 6.917
RUNOFF VOLUME (mm)= 33.551
TOTAL RAINFALL (mm)= 95.969
RUNOFF COEFFICIENT = 0.350

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

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

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 647.700
| Ptotal= 34.80 mm |                          B=   4.000
--------------------                          C=   0.784
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	2.27	1.17	17.17	2.17	5.25	3.17	2.69
0.33	2.59	1.33	81.81	2.33	4.49	3.33	2.50
0.50	3.04	1.50	22.50	2.50	3.93	3.50	2.34
0.67	3.72	1.67	11.86	2.67	3.51	3.67	2.20
0.83	4.86	1.83	8.23	2.83	3.18	3.83	2.08
1.00	7.29	2.00	6.38	3.00	2.91	4.00	1.98

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

         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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50
0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20
0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08

0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 1.767
RUNOFF VOLUME (mm)= 5.732
TOTAL RAINFALL (mm)= 34.800
RUNOFF COEFFICIENT = 0.165

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

CALIB
STANDHYD (0001)
ID= 1 DT= 1.0 min

Area (ha)= 2.91
Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50
0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20

0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08
0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Max.Eff.Inten.(mm/hr)=	81.81	6.18	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.99 (ii)	9.37 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.31	0.12	
			TOTALS
PEAK FLOW (cms)=	0.31	0.01	0.321 (iii)
TIME TO PEAK (hrs)=	1.33	1.47	1.33
RUNOFF VOLUME (mm)=	33.80	3.20	18.80
TOTAL RAINFALL (mm)=	34.80	34.80	34.80
RUNOFF COEFFICIENT =	0.97	0.09	0.54

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0028)
ID= 1 DT= 1.0 min

Area (ha)= 0.29
Total Imp(%)= 67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50

0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20
0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08
0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Max.Eff.Inten.(mm/hr)=	81.81	4.78		
over (min)	5.00	8.00		
Storage Coeff. (min)=	1.69 (ii)	7.45 (ii)		
Unit Hyd. Tpeak (min)=	5.00	8.00		
Unit Hyd. peak (cms)=	0.40	0.15		
			TOTALS	
PEAK FLOW (cms)=	0.04	0.00	0.044 (iii)	
TIME TO PEAK (hrs)=	1.33	1.43	1.33	
RUNOFF VOLUME (mm)=	33.80	2.81	23.56	
TOTAL RAINFALL (mm)=	34.80	34.80	34.80	
RUNOFF COEFFICIENT =	0.97	0.08	0.68	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0016)|				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	2.91	0.321	1.33	18.80
+ ID2= 2 (0025):	1.43	0.017	1.77	5.73
ID = 3 (0016):	4.34	0.324	1.33	14.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0016)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0016):	4.34	0.324	1.33	14.50
	+ ID2= 2 (0028):	0.29	0.044	1.33	23.56
	ID = 1 (0016):	4.63	0.368	1.33	15.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0003)	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	0.0130	0.0895
	0.0000	0.0291	0.0210	0.1555
	0.0010	0.0332	0.0230	0.1780
	0.0040	0.0496	0.0280	0.2176
	0.0050	0.0537	0.0300	0.2309

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0016)	4.630	0.368	1.33	15.06
OUTFLOW: ID= 1 (0003)	4.630	0.007	4.10	7.95

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.98
TIME SHIFT OF PEAK FLOW (min)=166.00
MAXIMUM STORAGE USED (ha.m.)= 0.0638

CALIB			
NASHYD (0026)	Area (ha)= 0.27	Curve Number (CN)= 71.0	
ID= 1 DT= 1.0 min	Ia (mm)= 3.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.02		

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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50
0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20

0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08
0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.015 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 7.266
TOTAL RAINFALL (mm)= 34.800
RUNOFF COEFFICIENT = 0.209

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

CALIB
STANDHYD (0007) | Area (ha)= 1.75
ID= 1 DT= 1.0 min | Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50
0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50

0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20
0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08
0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Max.Eff.Inten.(mm/hr)=	81.81	6.89		
over (min)	5.00	10.00		
Storage Coeff. (min)=	2.90 (ii)	9.98 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.31	0.11		
			TOTALS	
PEAK FLOW (cms)=	0.19	0.01	0.194 (iii)	
TIME TO PEAK (hrs)=	1.33	1.47	1.33	
RUNOFF VOLUME (mm)=	33.80	3.37	18.89	
TOTAL RAINFALL (mm)=	34.80	34.80	34.80	
RUNOFF COEFFICIENT =	0.97	0.10	0.54	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0018)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0026):		0.27	0.015	1.33	7.27
+ ID2= 2 (0007):		1.75	0.194	1.33	18.89
ID = 3 (0018):		2.02	0.209	1.33	17.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0009)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0007	0.0212	0.0291

0.0037	0.0045	0.0402	0.0316
0.0053	0.0065	0.1203	0.0341
0.0081	0.0128	0.2476	0.0366
0.0101	0.0188	0.3901	0.0373
0.0118	0.0250	0.4841	0.0381
0.0126	0.0279	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	2.020	0.209	1.33	17.33
OUTFLOW: ID= 1 (0009)	2.020	0.012	2.62	16.86

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.64
TIME SHIFT OF PEAK FLOW (min)= 77.00
MAXIMUM STORAGE USED (ha.m.)= 0.0249

CALIB NASHYD (0027) ID= 1 DT= 1.0 min	Area (ha)= 16.11 Curve Number (CN)= 61.0 Ia (mm)= 5.60 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.95

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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50
0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20
0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08
0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08

0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.075 (i)
TIME TO PEAK (hrs)= 2.650
RUNOFF VOLUME (mm)= 4.450
TOTAL RAINFALL (mm)= 34.800
RUNOFF COEFFICIENT = 0.128

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

CALIB
STANDHYD (0006)
ID= 1 DT= 1.0 min

Area (ha)= 0.75
Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50
0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20
0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20

0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08
0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Max.Eff.Inten.(mm/hr)=	81.81	38.39	
over (min)	5.00	6.00	
Storage Coeff. (min)=	2.25 (ii)	5.68 (ii)	
Unit Hyd. Tpeak (min)=	5.00	6.00	
Unit Hyd. peak (cms)=	0.36	0.20	
			TOTALS
PEAK FLOW (cms)=	0.12	0.01	0.128 (iii)
TIME TO PEAK (hrs)=	1.33	1.38	1.33
RUNOFF VOLUME (mm)=	33.80	7.56	26.97
TOTAL RAINFALL (mm)=	34.80	34.80	34.80
RUNOFF COEFFICIENT =	0.97	0.22	0.78

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0011) | IN= 2---> OUT= 1 | DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0912	0.0179
	0.0006	0.0005	0.1027	0.0204
	0.0062	0.0056	0.1264	0.0248
	0.0100	0.0060	0.1349	0.0263
	0.0470	0.0101	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0006)	0.750	0.128	1.33	26.97
OUTFLOW: ID= 1 (0011)	0.750	0.043	1.50	26.69

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.52
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0096

CALIB | STANDHYD (0008) |ID= 1 DT= 1.0 min |	Area (ha)= 2.20	Total Imp(%)= 59.00	Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.30	0.90
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	121.11	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	2.27	1.017	17.17	2.017	5.25	3.02	2.69
0.033	2.27	1.033	17.17	2.033	5.25	3.03	2.69
0.050	2.27	1.050	17.17	2.050	5.25	3.05	2.69
0.067	2.27	1.067	17.17	2.067	5.25	3.07	2.69
0.083	2.27	1.083	17.17	2.083	5.25	3.08	2.69
0.100	2.27	1.100	17.17	2.100	5.25	3.10	2.69
0.117	2.27	1.117	17.17	2.117	5.25	3.12	2.69
0.133	2.27	1.133	17.17	2.133	5.25	3.13	2.69
0.150	2.27	1.150	17.17	2.150	5.25	3.15	2.69
0.167	2.27	1.167	17.17	2.167	5.25	3.17	2.69
0.183	2.59	1.183	81.81	2.183	4.49	3.18	2.50
0.200	2.59	1.200	81.81	2.200	4.49	3.20	2.50
0.217	2.59	1.217	81.81	2.217	4.49	3.22	2.50
0.233	2.59	1.233	81.81	2.233	4.49	3.23	2.50
0.250	2.59	1.250	81.81	2.250	4.49	3.25	2.50
0.267	2.59	1.267	81.81	2.267	4.49	3.27	2.50
0.283	2.59	1.283	81.81	2.283	4.49	3.28	2.50
0.300	2.59	1.300	81.81	2.300	4.49	3.30	2.50
0.317	2.59	1.317	81.81	2.317	4.49	3.32	2.50
0.333	2.59	1.333	81.81	2.333	4.49	3.33	2.50
0.350	3.04	1.350	22.50	2.350	3.93	3.35	2.34
0.367	3.04	1.367	22.50	2.367	3.93	3.37	2.34
0.383	3.04	1.383	22.50	2.383	3.93	3.38	2.34
0.400	3.04	1.400	22.50	2.400	3.93	3.40	2.34
0.417	3.04	1.417	22.50	2.417	3.93	3.42	2.34
0.433	3.04	1.433	22.50	2.433	3.93	3.43	2.34
0.450	3.04	1.450	22.50	2.450	3.93	3.45	2.34
0.467	3.04	1.467	22.50	2.467	3.93	3.47	2.34
0.483	3.04	1.483	22.50	2.483	3.93	3.48	2.34
0.500	3.04	1.500	22.50	2.500	3.93	3.50	2.34
0.517	3.72	1.517	11.86	2.517	3.51	3.52	2.20
0.533	3.72	1.533	11.86	2.533	3.51	3.53	2.20
0.550	3.72	1.550	11.86	2.550	3.51	3.55	2.20
0.567	3.72	1.567	11.86	2.567	3.51	3.57	2.20
0.583	3.72	1.583	11.86	2.583	3.51	3.58	2.20
0.600	3.72	1.600	11.86	2.600	3.51	3.60	2.20
0.617	3.72	1.617	11.86	2.617	3.51	3.62	2.20
0.633	3.72	1.633	11.86	2.633	3.51	3.63	2.20
0.650	3.72	1.650	11.86	2.650	3.51	3.65	2.20
0.667	3.72	1.667	11.86	2.667	3.51	3.67	2.20
0.683	4.86	1.683	8.23	2.683	3.18	3.68	2.08
0.700	4.86	1.700	8.23	2.700	3.18	3.70	2.08
0.717	4.86	1.717	8.23	2.717	3.18	3.72	2.08
0.733	4.86	1.733	8.23	2.733	3.18	3.73	2.08
0.750	4.86	1.750	8.23	2.750	3.18	3.75	2.08
0.767	4.86	1.767	8.23	2.767	3.18	3.77	2.08
0.783	4.86	1.783	8.23	2.783	3.18	3.78	2.08
0.800	4.86	1.800	8.23	2.800	3.18	3.80	2.08
0.817	4.86	1.817	8.23	2.817	3.18	3.82	2.08
0.833	4.86	1.833	8.23	2.833	3.18	3.83	2.08
0.850	7.29	1.850	6.38	2.850	2.91	3.85	1.98
0.867	7.29	1.867	6.38	2.867	2.91	3.87	1.98
0.883	7.29	1.883	6.38	2.883	2.91	3.88	1.98
0.900	7.29	1.900	6.38	2.900	2.91	3.90	1.98
0.917	7.29	1.917	6.38	2.917	2.91	3.92	1.98
0.933	7.29	1.933	6.38	2.933	2.91	3.93	1.98
0.950	7.29	1.950	6.38	2.950	2.91	3.95	1.98
0.967	7.29	1.967	6.38	2.967	2.91	3.97	1.98
0.983	7.29	1.983	6.38	2.983	2.91	3.98	1.98
1.000	7.29	2.000	6.38	3.000	2.91	4.00	1.98

Max.Eff.Inten.(mm/hr)=	81.81	9.48	
over (min)	5.00	11.00	
Storage Coeff. (min)=	3.11 (ii)	10.47 (ii)	
Unit Hyd. Tpeak (min)=	5.00	11.00	
Unit Hyd. peak (cms)=	0.30	0.11	
			TOTALS
PEAK FLOW (cms)=	0.21	0.01	0.215 (iii)
TIME TO PEAK (hrs)=	1.33	1.48	1.35
RUNOFF VOLUME (mm)=	33.80	3.95	17.38
TOTAL RAINFALL (mm)=	34.80	34.80	34.80
RUNOFF COEFFICIENT =	0.97	0.11	0.50

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

```
          THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0010)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0570      0.0442
                          0.0008     0.0012   |   0.0640      0.0503
                          0.0063     0.0138   |   0.0780      0.0611
                          0.0090     0.0149   |   0.0830      0.0649
                          0.0320     0.0249   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0008)      2.200      0.215      1.35      17.38
   OUTFLOW: ID= 1 (  0010)      2.200      0.029      1.90      17.21

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.27
                  TIME SHIFT OF PEAK FLOW         (min)= 33.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0234

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0039)|   Area    (ha)=   0.08
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.04
     Dep. Storage     (mm)=       1.00         2.30
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      23.09        40.00
     Mannings n           =      0.013        0.250

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


                              ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.27 | 1.083   17.17 | 2.083    5.25 |  3.08    2.69
               0.167    2.27 | 1.167   17.17 | 2.167    5.25 |  3.17    2.69
               0.250    2.59 | 1.250   81.81 | 2.250    4.49 |  3.25    2.50
               0.333    2.59 | 1.333   81.81 | 2.333    4.49 |  3.33    2.50
               0.417    3.04 | 1.417   22.50 | 2.417    3.93 |  3.42    2.34
               0.500    3.04 | 1.500   22.50 | 2.500    3.93 |  3.50    2.34
               0.583    3.72 | 1.583   11.86 | 2.583    3.51 |  3.58    2.20
               0.667    3.72 | 1.667   11.86 | 2.667    3.51 |  3.67    2.20
               0.750    4.86 | 1.750    8.23 | 2.750    3.18 |  3.75    2.08
               0.833    4.86 | 1.833    8.23 | 2.833    3.18 |  3.83    2.08
               0.917    7.29 | 1.917    6.38 | 2.917    2.91 |  3.92    1.98
               1.000    7.29 | 2.000    6.38 | 3.000    2.91 |  4.00    1.98

     Max.Eff.Inten.(mm/hr)=      81.81        76.07
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.15 (ii)    9.02 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.011 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      33.80        23.98          27.35
     TOTAL RAINFALL   (mm)=      34.80        34.80          34.80
     RUNOFF COEFFICIENT   =       0.97         0.69           0.79

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  94.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
```

```
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.20   0.029     1.90    17.21
      + ID2= 2 (  0011):     0.75   0.043     1.50    26.69
        ================================================
        ID = 3 (  0004):     2.95   0.066     1.57    19.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):     2.95   0.066     1.57    19.62
      + ID2= 2 (  0027):    16.11   0.075     2.65     4.45
        ================================================
        ID = 1 (  0004):    19.06   0.110     2.40     6.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    19.06   0.110     2.40     6.80
      + ID2= 2 (  0003):     4.63   0.007     4.10     7.95
        ================================================
        ID = 3 (  0004):    23.69   0.115     2.42     7.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):    23.69   0.115     2.42     7.02
      + ID2= 2 (  0039):     0.08   0.011     1.33    27.35
        ================================================
        ID = 1 (  0004):    23.77   0.116     2.40     7.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    23.77   0.116     2.40     7.09
      + ID2= 2 (  0009):     2.02   0.012     2.62    16.86
        ================================================
        ID = 3 (  0004):    25.79   0.128     2.40     7.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  **********************************************
  ** SIMULATION : Run 02                       **
  **********************************************

-------------------
| CHICAGO STORM    |    IDF curve parameters: A= 929.800
| Ptotal= 46.26 mm |                          B=   4.000
-------------------                          C=   0.798
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    2.85 |  1.17   22.78 |  2.17    6.71 |  3.17    3.38
                0.33    3.26 |  1.33  113.18 |  2.33    5.71 |  3.33    3.14
                0.50    3.84 |  1.50   30.05 |  2.50    4.99 |  3.50    2.94
                0.67    4.71 |  1.67   15.53 |  2.67    4.45 |  3.67    2.76
                0.83    6.21 |  1.83   10.66 |  2.83    4.02 |  3.83    2.60
```

1.00	9.42	2.00	8.20	3.00	3.67	4.00	2.47

CALIB			
NASHYD (0025)	Area (ha)=	1.43	Curve Number (CN)= 67.0
ID= 1 DT= 1.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.34	

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	2.85	1.017	22.78	2.017	6.71	3.02	3.38
0.033	2.85	1.033	22.78	2.033	6.71	3.03	3.38
0.050	2.85	1.050	22.78	2.050	6.71	3.05	3.38
0.067	2.85	1.067	22.78	2.067	6.71	3.07	3.38
0.083	2.85	1.083	22.78	2.083	6.71	3.08	3.38
0.100	2.85	1.100	22.78	2.100	6.71	3.10	3.38
0.117	2.85	1.117	22.78	2.117	6.71	3.12	3.38
0.133	2.85	1.133	22.78	2.133	6.71	3.13	3.38
0.150	2.85	1.150	22.78	2.150	6.71	3.15	3.38
0.167	2.85	1.167	22.78	2.167	6.71	3.17	3.38
0.183	3.26	1.183	113.18	2.183	5.71	3.18	3.14
0.200	3.26	1.200	113.18	2.200	5.71	3.20	3.14
0.217	3.26	1.217	113.18	2.217	5.71	3.22	3.14
0.233	3.26	1.233	113.18	2.233	5.71	3.23	3.14
0.250	3.26	1.250	113.18	2.250	5.71	3.25	3.14
0.267	3.26	1.267	113.18	2.267	5.71	3.27	3.14
0.283	3.26	1.283	113.18	2.283	5.71	3.28	3.14
0.300	3.26	1.300	113.18	2.300	5.71	3.30	3.14
0.317	3.26	1.317	113.18	2.317	5.71	3.32	3.14
0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.350	3.84	1.350	30.05	2.350	4.99	3.35	2.94
0.367	3.84	1.367	30.05	2.367	4.99	3.37	2.94
0.383	3.84	1.383	30.05	2.383	4.99	3.38	2.94
0.400	3.84	1.400	30.05	2.400	4.99	3.40	2.94
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.433	3.84	1.433	30.05	2.433	4.99	3.43	2.94
0.450	3.84	1.450	30.05	2.450	4.99	3.45	2.94
0.467	3.84	1.467	30.05	2.467	4.99	3.47	2.94
0.483	3.84	1.483	30.05	2.483	4.99	3.48	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.517	4.71	1.517	15.53	2.517	4.45	3.52	2.76
0.533	4.71	1.533	15.53	2.533	4.45	3.53	2.76
0.550	4.71	1.550	15.53	2.550	4.45	3.55	2.76
0.567	4.71	1.567	15.53	2.567	4.45	3.57	2.76
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.600	4.71	1.600	15.53	2.600	4.45	3.60	2.76
0.617	4.71	1.617	15.53	2.617	4.45	3.62	2.76
0.633	4.71	1.633	15.53	2.633	4.45	3.63	2.76
0.650	4.71	1.650	15.53	2.650	4.45	3.65	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.683	6.21	1.683	10.66	2.683	4.02	3.68	2.61
0.700	6.21	1.700	10.66	2.700	4.02	3.70	2.60
0.717	6.21	1.717	10.66	2.717	4.02	3.72	2.60
0.733	6.21	1.733	10.66	2.733	4.02	3.73	2.60
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.60
0.767	6.21	1.767	10.66	2.767	4.02	3.77	2.60
0.783	6.21	1.783	10.66	2.783	4.02	3.78	2.60
0.800	6.21	1.800	10.66	2.800	4.02	3.80	2.60
0.817	6.21	1.817	10.66	2.817	4.02	3.82	2.60
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.60
0.850	9.42	1.850	8.20	2.850	3.67	3.85	2.47
0.867	9.42	1.867	8.20	2.867	3.67	3.87	2.47
0.883	9.42	1.883	8.20	2.883	3.67	3.88	2.47
0.900	9.42	1.900	8.20	2.900	3.67	3.90	2.47
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
0.933	9.42	1.933	8.20	2.933	3.67	3.93	2.47
0.950	9.42	1.950	8.20	2.950	3.67	3.95	2.47
0.967	9.42	1.967	8.20	2.967	3.67	3.97	2.47
0.983	9.42	1.983	8.20	2.983	3.67	3.98	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.032 (i)
TIME TO PEAK (hrs)= 1.733
RUNOFF VOLUME (mm)= 10.231
TOTAL RAINFALL (mm)= 46.257
RUNOFF COEFFICIENT = 0.221

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

CALIB
STANDHYD (0001)
ID= 1 DT= 1.0 min

Area (ha)= 2.91
Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	2.85	1.017	22.78	2.017	6.71	3.02	3.38
0.033	2.85	1.033	22.78	2.033	6.71	3.03	3.38
0.050	2.85	1.050	22.78	2.050	6.71	3.05	3.38
0.067	2.85	1.067	22.78	2.067	6.71	3.07	3.38
0.083	2.85	1.083	22.78	2.083	6.71	3.08	3.38
0.100	2.85	1.100	22.78	2.100	6.71	3.10	3.38
0.117	2.85	1.117	22.78	2.117	6.71	3.12	3.38
0.133	2.85	1.133	22.78	2.133	6.71	3.13	3.38
0.150	2.85	1.150	22.78	2.150	6.71	3.15	3.38
0.167	2.85	1.167	22.78	2.167	6.71	3.17	3.38
0.183	3.26	1.183	113.18	2.183	5.71	3.18	3.14
0.200	3.26	1.200	113.18	2.200	5.71	3.20	3.14
0.217	3.26	1.217	113.18	2.217	5.71	3.22	3.14
0.233	3.26	1.233	113.18	2.233	5.71	3.23	3.14
0.250	3.26	1.250	113.18	2.250	5.71	3.25	3.14
0.267	3.26	1.267	113.18	2.267	5.71	3.27	3.14
0.283	3.26	1.283	113.18	2.283	5.71	3.28	3.14
0.300	3.26	1.300	113.18	2.300	5.71	3.30	3.14
0.317	3.26	1.317	113.18	2.317	5.71	3.32	3.14
0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.350	3.84	1.350	30.05	2.350	4.99	3.35	2.94
0.367	3.84	1.367	30.05	2.367	4.99	3.37	2.94
0.383	3.84	1.383	30.05	2.383	4.99	3.38	2.94
0.400	3.84	1.400	30.05	2.400	4.99	3.40	2.94
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.433	3.84	1.433	30.05	2.433	4.99	3.43	2.94
0.450	3.84	1.450	30.05	2.450	4.99	3.45	2.94
0.467	3.84	1.467	30.05	2.467	4.99	3.47	2.94
0.483	3.84	1.483	30.05	2.483	4.99	3.48	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.517	4.71	1.517	15.53	2.517	4.45	3.52	2.76
0.533	4.71	1.533	15.53	2.533	4.45	3.53	2.76
0.550	4.71	1.550	15.53	2.550	4.45	3.55	2.76
0.567	4.71	1.567	15.53	2.567	4.45	3.57	2.76
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.600	4.71	1.600	15.53	2.600	4.45	3.60	2.76
0.617	4.71	1.617	15.53	2.617	4.45	3.62	2.76
0.633	4.71	1.633	15.53	2.633	4.45	3.63	2.76
0.650	4.71	1.650	15.53	2.650	4.45	3.65	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.683	6.21	1.683	10.66	2.683	4.02	3.68	2.61
0.700	6.21	1.700	10.66	2.700	4.02	3.70	2.60
0.717	6.21	1.717	10.66	2.717	4.02	3.72	2.60
0.733	6.21	1.733	10.66	2.733	4.02	3.73	2.60
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.60
0.767	6.21	1.767	10.66	2.767	4.02	3.77	2.60
0.783	6.21	1.783	10.66	2.783	4.02	3.78	2.60
0.800	6.21	1.800	10.66	2.800	4.02	3.80	2.60
0.817	6.21	1.817	10.66	2.817	4.02	3.82	2.60
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.60
0.850	9.42	1.850	8.20	2.850	3.67	3.85	2.47
0.867	9.42	1.867	8.20	2.867	3.67	3.87	2.47

0.883	9.42	1.883	8.20	2.883	3.67	3.88	2.47
0.900	9.42	1.900	8.20	2.900	3.67	3.90	2.47
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
0.933	9.42	1.933	8.20	2.933	3.67	3.93	2.47
0.950	9.42	1.950	8.20	2.950	3.67	3.95	2.47
0.967	9.42	1.967	8.20	2.967	3.67	3.97	2.47
0.983	9.42	1.983	8.20	2.983	3.67	3.98	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

			TOTALS
Max.Eff.Inten.(mm/hr)=	113.18	12.39	
over (min)	5.00	9.00	
Storage Coeff. (min)=	2.63 (ii)	8.23 (ii)	
Unit Hyd. Tpeak (min)=	5.00	9.00	
Unit Hyd. peak (cms)=	0.33	0.13	
PEAK FLOW (cms)=	0.44	0.03	0.461 (iii)
TIME TO PEAK (hrs)=	1.33	1.45	1.33
RUNOFF VOLUME (mm)=	45.26	5.83	25.94
TOTAL RAINFALL (mm)=	46.26	46.26	46.26
RUNOFF COEFFICIENT =	0.98	0.13	0.56

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
STANDHYD (0028)	Area (ha)=	0.29
ID= 1 DT= 1.0 min	Total Imp(%)=	67.00 Dir. Conn.(%)= 67.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.19	0.10
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	43.97	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	2.85	1.017	22.78	2.017	6.71	3.02	3.38
0.033	2.85	1.033	22.78	2.033	6.71	3.03	3.38
0.050	2.85	1.050	22.78	2.050	6.71	3.05	3.38
0.067	2.85	1.067	22.78	2.067	6.71	3.07	3.38
0.083	2.85	1.083	22.78	2.083	6.71	3.08	3.38
0.100	2.85	1.100	22.78	2.100	6.71	3.10	3.38
0.117	2.85	1.117	22.78	2.117	6.71	3.12	3.38
0.133	2.85	1.133	22.78	2.133	6.71	3.13	3.38
0.150	2.85	1.150	22.78	2.150	6.71	3.15	3.38
0.167	2.85	1.167	22.78	2.167	6.71	3.17	3.38
0.183	3.26	1.183	113.18	2.183	5.71	3.18	3.14
0.200	3.26	1.200	113.18	2.200	5.71	3.20	3.14
0.217	3.26	1.217	113.18	2.217	5.71	3.22	3.14
0.233	3.26	1.233	113.18	2.233	5.71	3.23	3.14
0.250	3.26	1.250	113.18	2.250	5.71	3.25	3.14
0.267	3.26	1.267	113.18	2.267	5.71	3.27	3.14
0.283	3.26	1.283	113.18	2.283	5.71	3.28	3.14
0.300	3.26	1.300	113.18	2.300	5.71	3.30	3.14
0.317	3.26	1.317	113.18	2.317	5.71	3.32	3.14
0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.350	3.84	1.350	30.05	2.350	4.99	3.35	2.94
0.367	3.84	1.367	30.05	2.367	4.99	3.37	2.94
0.383	3.84	1.383	30.05	2.383	4.99	3.38	2.94
0.400	3.84	1.400	30.05	2.400	4.99	3.40	2.94
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.433	3.84	1.433	30.05	2.433	4.99	3.43	2.94
0.450	3.84	1.450	30.05	2.450	4.99	3.45	2.94
0.467	3.84	1.467	30.05	2.467	4.99	3.47	2.94
0.483	3.84	1.483	30.05	2.483	4.99	3.48	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.517	4.71	1.517	15.53	2.517	4.45	3.52	2.76
0.533	4.71	1.533	15.53	2.533	4.45	3.53	2.76

0.550	4.71	1.550	15.53	2.550	4.45	3.55	2.76
0.567	4.71	1.567	15.53	2.567	4.45	3.57	2.76
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.600	4.71	1.600	15.53	2.600	4.45	3.60	2.76
0.617	4.71	1.617	15.53	2.617	4.45	3.62	2.76
0.633	4.71	1.633	15.53	2.633	4.45	3.63	2.76
0.650	4.71	1.650	15.53	2.650	4.45	3.65	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.683	6.21	1.683	10.66	2.683	4.02	3.68	2.61
0.700	6.21	1.700	10.66	2.700	4.02	3.70	2.60
0.717	6.21	1.717	10.66	2.717	4.02	3.72	2.60
0.733	6.21	1.733	10.66	2.733	4.02	3.73	2.60
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.60
0.767	6.21	1.767	10.66	2.767	4.02	3.77	2.60
0.783	6.21	1.783	10.66	2.783	4.02	3.78	2.60
0.800	6.21	1.800	10.66	2.800	4.02	3.80	2.60
0.817	6.21	1.817	10.66	2.817	4.02	3.82	2.60
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.60
0.850	9.42	1.850	8.20	2.850	3.67	3.85	2.47
0.867	9.42	1.867	8.20	2.867	3.67	3.87	2.47
0.883	9.42	1.883	8.20	2.883	3.67	3.88	2.47
0.900	9.42	1.900	8.20	2.900	3.67	3.90	2.47
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
0.933	9.42	1.933	8.20	2.933	3.67	3.93	2.47
0.950	9.42	1.950	8.20	2.950	3.67	3.95	2.47
0.967	9.42	1.967	8.20	2.967	3.67	3.97	2.47
0.983	9.42	1.983	8.20	2.983	3.67	3.98	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Max.Eff.Inten.(mm/hr)=	113.18	9.76		
over (min)	5.00	7.00		
Storage Coeff. (min)=	1.48 (ii)	6.54 (ii)		
Unit Hyd. Tpeak (min)=	5.00	7.00		
Unit Hyd. peak (cms)=	0.42	0.17		
			TOTALS	
PEAK FLOW (cms)=	0.06	0.00	0.062 (iii)	
TIME TO PEAK (hrs)=	1.33	1.42	1.33	
RUNOFF VOLUME (mm)=	45.26	5.19	32.03	
TOTAL RAINFALL (mm)=	46.26	46.26	46.26	
RUNOFF COEFFICIENT =	0.98	0.11	0.69	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0016)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0001):	2.91	0.461	1.33	25.94	
+ ID2= 2 (0025):	1.43	0.032	1.73	10.23	
ID = 3 (0016):	4.34	0.467	1.33	20.76	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0016)					
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 3 (0016):	4.34	0.467	1.33	20.76	
+ ID2= 2 (0028):	0.29	0.062	1.33	32.03	
ID = 1 (0016):	4.63	0.529	1.33	21.47	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0003)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.0130	0.0895

0.0000	0.0291	0.0210	0.1555
0.0010	0.0332	0.0230	0.1780
0.0040	0.0496	0.0280	0.2176
0.0050	0.0537	0.0300	0.2309

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0016)	4.630	0.529	1.33	21.47
OUTFLOW: ID= 1 (0003)	4.630	0.013	4.08	13.71

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.41
TIME SHIFT OF PEAK FLOW (min)=165.00
MAXIMUM STORAGE USED (ha.m.)= 0.0884

CALIB	
NASHYD (0026)	Area (ha)= 0.27 Curve Number (CN)= 71.0
ID= 1 DT= 1.0 min	Ia (mm)= 3.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.02

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	2.85	1.017	22.78	2.017	6.71	3.02	3.38
0.033	2.85	1.033	22.78	2.033	6.71	3.03	3.38
0.050	2.85	1.050	22.78	2.050	6.71	3.05	3.38
0.067	2.85	1.067	22.78	2.067	6.71	3.07	3.38
0.083	2.85	1.083	22.78	2.083	6.71	3.08	3.38
0.100	2.85	1.100	22.78	2.100	6.71	3.10	3.38
0.117	2.85	1.117	22.78	2.117	6.71	3.12	3.38
0.133	2.85	1.133	22.78	2.133	6.71	3.13	3.38
0.150	2.85	1.150	22.78	2.150	6.71	3.15	3.38
0.167	2.85	1.167	22.78	2.167	6.71	3.17	3.38
0.183	3.26	1.183	113.18	2.183	5.71	3.18	3.14
0.200	3.26	1.200	113.18	2.200	5.71	3.20	3.14
0.217	3.26	1.217	113.18	2.217	5.71	3.22	3.14
0.233	3.26	1.233	113.18	2.233	5.71	3.23	3.14
0.250	3.26	1.250	113.18	2.250	5.71	3.25	3.14
0.267	3.26	1.267	113.18	2.267	5.71	3.27	3.14
0.283	3.26	1.283	113.18	2.283	5.71	3.28	3.14
0.300	3.26	1.300	113.18	2.300	5.71	3.30	3.14
0.317	3.26	1.317	113.18	2.317	5.71	3.32	3.14
0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.350	3.84	1.350	30.05	2.350	4.99	3.35	2.94
0.367	3.84	1.367	30.05	2.367	4.99	3.37	2.94
0.383	3.84	1.383	30.05	2.383	4.99	3.38	2.94
0.400	3.84	1.400	30.05	2.400	4.99	3.40	2.94
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.433	3.84	1.433	30.05	2.433	4.99	3.43	2.94
0.450	3.84	1.450	30.05	2.450	4.99	3.45	2.94
0.467	3.84	1.467	30.05	2.467	4.99	3.47	2.94
0.483	3.84	1.483	30.05	2.483	4.99	3.48	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.517	4.71	1.517	15.53	2.517	4.45	3.52	2.76
0.533	4.71	1.533	15.53	2.533	4.45	3.53	2.76
0.550	4.71	1.550	15.53	2.550	4.45	3.55	2.76
0.567	4.71	1.567	15.53	2.567	4.45	3.57	2.76
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.600	4.71	1.600	15.53	2.600	4.45	3.60	2.76
0.617	4.71	1.617	15.53	2.617	4.45	3.62	2.76
0.633	4.71	1.633	15.53	2.633	4.45	3.63	2.76
0.650	4.71	1.650	15.53	2.650	4.45	3.65	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.683	6.21	1.683	10.66	2.683	4.02	3.68	2.61
0.700	6.21	1.700	10.66	2.700	4.02	3.70	2.60
0.717	6.21	1.717	10.66	2.717	4.02	3.72	2.60
0.733	6.21	1.733	10.66	2.733	4.02	3.73	2.60
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.60
0.767	6.21	1.767	10.66	2.767	4.02	3.77	2.60
0.783	6.21	1.783	10.66	2.783	4.02	3.78	2.60
0.800	6.21	1.800	10.66	2.800	4.02	3.80	2.60
0.817	6.21	1.817	10.66	2.817	4.02	3.82	2.60
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.60
0.850	9.42	1.850	8.20	2.850	3.67	3.85	2.47
0.867	9.42	1.867	8.20	2.867	3.67	3.87	2.47

0.883	9.42	1.883	8.20	2.883	3.67	3.88	2.47
0.900	9.42	1.900	8.20	2.900	3.67	3.90	2.47
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
0.933	9.42	1.933	8.20	2.933	3.67	3.93	2.47
0.950	9.42	1.950	8.20	2.950	3.67	3.95	2.47
0.967	9.42	1.967	8.20	2.967	3.67	3.97	2.47
0.983	9.42	1.983	8.20	2.983	3.67	3.98	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 12.398
TOTAL RAINFALL (mm)= 46.257
RUNOFF COEFFICIENT = 0.268

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

CALIB	
STANDHYD (0007)	Area (ha)= 1.75
ID= 1 DT= 1.0 min	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	2.85	1.017	22.78	2.017	6.71	3.02	3.38
0.033	2.85	1.033	22.78	2.033	6.71	3.03	3.38
0.050	2.85	1.050	22.78	2.050	6.71	3.05	3.38
0.067	2.85	1.067	22.78	2.067	6.71	3.07	3.38
0.083	2.85	1.083	22.78	2.083	6.71	3.08	3.38
0.100	2.85	1.100	22.78	2.100	6.71	3.10	3.38
0.117	2.85	1.117	22.78	2.117	6.71	3.12	3.38
0.133	2.85	1.133	22.78	2.133	6.71	3.13	3.38
0.150	2.85	1.150	22.78	2.150	6.71	3.15	3.38
0.167	2.85	1.167	22.78	2.167	6.71	3.17	3.38
0.183	3.26	1.183	113.18	2.183	5.71	3.18	3.14
0.200	3.26	1.200	113.18	2.200	5.71	3.20	3.14
0.217	3.26	1.217	113.18	2.217	5.71	3.22	3.14
0.233	3.26	1.233	113.18	2.233	5.71	3.23	3.14
0.250	3.26	1.250	113.18	2.250	5.71	3.25	3.14
0.267	3.26	1.267	113.18	2.267	5.71	3.27	3.14
0.283	3.26	1.283	113.18	2.283	5.71	3.28	3.14
0.300	3.26	1.300	113.18	2.300	5.71	3.30	3.14
0.317	3.26	1.317	113.18	2.317	5.71	3.32	3.14
0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.350	3.84	1.350	30.05	2.350	4.99	3.35	2.94
0.367	3.84	1.367	30.05	2.367	4.99	3.37	2.94
0.383	3.84	1.383	30.05	2.383	4.99	3.38	2.94
0.400	3.84	1.400	30.05	2.400	4.99	3.40	2.94
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.433	3.84	1.433	30.05	2.433	4.99	3.43	2.94
0.450	3.84	1.450	30.05	2.450	4.99	3.45	2.94
0.467	3.84	1.467	30.05	2.467	4.99	3.47	2.94
0.483	3.84	1.483	30.05	2.483	4.99	3.48	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.517	4.71	1.517	15.53	2.517	4.45	3.52	2.76
0.533	4.71	1.533	15.53	2.533	4.45	3.53	2.76
0.550	4.71	1.550	15.53	2.550	4.45	3.55	2.76
0.567	4.71	1.567	15.53	2.567	4.45	3.57	2.76
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.600	4.71	1.600	15.53	2.600	4.45	3.60	2.76
0.617	4.71	1.617	15.53	2.617	4.45	3.62	2.76
0.633	4.71	1.633	15.53	2.633	4.45	3.63	2.76
0.650	4.71	1.650	15.53	2.650	4.45	3.65	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.683	6.21	1.683	10.66	2.683	4.02	3.68	2.61

```
                0.700    6.21 | 1.700   10.66 | 2.700    4.02 |  3.70    2.60
                0.717    6.21 | 1.717   10.66 | 2.717    4.02 |  3.72    2.60
                0.733    6.21 | 1.733   10.66 | 2.733    4.02 |  3.73    2.60
                0.750    6.21 | 1.750   10.66 | 2.750    4.02 |  3.75    2.60
                0.767    6.21 | 1.767   10.66 | 2.767    4.02 |  3.77    2.60
                0.783    6.21 | 1.783   10.66 | 2.783    4.02 |  3.78    2.60
                0.800    6.21 | 1.800   10.66 | 2.800    4.02 |  3.80    2.60
                0.817    6.21 | 1.817   10.66 | 2.817    4.02 |  3.82    2.60
                0.833    6.21 | 1.833   10.66 | 2.833    4.02 |  3.83    2.60
                0.850    9.42 | 1.850    8.20 | 2.850    3.67 |  3.85    2.47
                0.867    9.42 | 1.867    8.20 | 2.867    3.67 |  3.87    2.47
                0.883    9.42 | 1.883    8.20 | 2.883    3.67 |  3.88    2.47
                0.900    9.42 | 1.900    8.20 | 2.900    3.67 |  3.90    2.47
                0.917    9.42 | 1.917    8.20 | 2.917    3.67 |  3.92    2.47
                0.933    9.42 | 1.933    8.20 | 2.933    3.67 |  3.93    2.47
                0.950    9.42 | 1.950    8.20 | 2.950    3.67 |  3.95    2.47
                0.967    9.42 | 1.967    8.20 | 2.967    3.67 |  3.97    2.47
                0.983    9.42 | 1.983    8.20 | 2.983    3.67 |  3.98    2.47
                1.000    9.42 | 2.000    8.20 | 3.000    3.67 |  4.00    2.47

     Max.Eff.Inten.(mm/hr)=     113.18        13.71
               over (min)        5.00         9.00
     Storage Coeff.  (min)=       2.55 (ii)    8.76 (ii)
     Unit Hyd. Tpeak (min)=       5.00         9.00
     Unit Hyd. peak  (cms)=       0.33         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.02          0.278 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.45           1.33
     RUNOFF VOLUME    (mm)=      45.26         6.13          26.08
     TOTAL RAINFALL   (mm)=      46.26        46.26          46.26
     RUNOFF COEFFICIENT   =       0.98         0.13           0.56


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0026):     0.27   0.026     1.33    12.40
     + ID2= 2 (  0007):     1.75   0.278     1.33    26.08
       ================================================
       ID = 3 (  0018):     2.02   0.305     1.33    24.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0009)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0007   |   0.0212      0.0291
                          0.0037     0.0045   |   0.0402      0.0316
                          0.0053     0.0065   |   0.1203      0.0341
                          0.0081     0.0128   |   0.2476      0.0366
                          0.0101     0.0188   |   0.3901      0.0373
                          0.0118     0.0250   |   0.4841      0.0381
                          0.0126     0.0279   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020      0.305      1.33      24.25
   OUTFLOW: ID= 1 (  0009)      2.020      0.038      1.85      23.78

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.44
                  TIME SHIFT OF PEAK FLOW         (min)= 31.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0313

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
```

---------- U.H. Tp(hrs)= 0.95

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	2.85	1.017	22.78	2.017	6.71	3.02	3.38
0.033	2.85	1.033	22.78	2.033	6.71	3.03	3.38
0.050	2.85	1.050	22.78	2.050	6.71	3.05	3.38
0.067	2.85	1.067	22.78	2.067	6.71	3.07	3.38
0.083	2.85	1.083	22.78	2.083	6.71	3.08	3.38
0.100	2.85	1.100	22.78	2.100	6.71	3.10	3.38
0.117	2.85	1.117	22.78	2.117	6.71	3.12	3.38
0.133	2.85	1.133	22.78	2.133	6.71	3.13	3.38
0.150	2.85	1.150	22.78	2.150	6.71	3.15	3.38
0.167	2.85	1.167	22.78	2.167	6.71	3.17	3.38
0.183	3.26	1.183	113.18	2.183	5.71	3.18	3.14
0.200	3.26	1.200	113.18	2.200	5.71	3.20	3.14
0.217	3.26	1.217	113.18	2.217	5.71	3.22	3.14
0.233	3.26	1.233	113.18	2.233	5.71	3.23	3.14
0.250	3.26	1.250	113.18	2.250	5.71	3.25	3.14
0.267	3.26	1.267	113.18	2.267	5.71	3.27	3.14
0.283	3.26	1.283	113.18	2.283	5.71	3.28	3.14
0.300	3.26	1.300	113.18	2.300	5.71	3.30	3.14
0.317	3.26	1.317	113.18	2.317	5.71	3.32	3.14
0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.350	3.84	1.350	30.05	2.350	4.99	3.35	2.94
0.367	3.84	1.367	30.05	2.367	4.99	3.37	2.94
0.383	3.84	1.383	30.05	2.383	4.99	3.38	2.94
0.400	3.84	1.400	30.05	2.400	4.99	3.40	2.94
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.433	3.84	1.433	30.05	2.433	4.99	3.43	2.94
0.450	3.84	1.450	30.05	2.450	4.99	3.45	2.94
0.467	3.84	1.467	30.05	2.467	4.99	3.47	2.94
0.483	3.84	1.483	30.05	2.483	4.99	3.48	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.517	4.71	1.517	15.53	2.517	4.45	3.52	2.76
0.533	4.71	1.533	15.53	2.533	4.45	3.53	2.76
0.550	4.71	1.550	15.53	2.550	4.45	3.55	2.76
0.567	4.71	1.567	15.53	2.567	4.45	3.57	2.76
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.600	4.71	1.600	15.53	2.600	4.45	3.60	2.76
0.617	4.71	1.617	15.53	2.617	4.45	3.62	2.76
0.633	4.71	1.633	15.53	2.633	4.45	3.63	2.76
0.650	4.71	1.650	15.53	2.650	4.45	3.65	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.683	6.21	1.683	10.66	2.683	4.02	3.68	2.61
0.700	6.21	1.700	10.66	2.700	4.02	3.70	2.60
0.717	6.21	1.717	10.66	2.717	4.02	3.72	2.60
0.733	6.21	1.733	10.66	2.733	4.02	3.73	2.60
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.60
0.767	6.21	1.767	10.66	2.767	4.02	3.77	2.60
0.783	6.21	1.783	10.66	2.783	4.02	3.78	2.60
0.800	6.21	1.800	10.66	2.800	4.02	3.80	2.60
0.817	6.21	1.817	10.66	2.817	4.02	3.82	2.60
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.60
0.850	9.42	1.850	8.20	2.850	3.67	3.85	2.47
0.867	9.42	1.867	8.20	2.867	3.67	3.87	2.47
0.883	9.42	1.883	8.20	2.883	3.67	3.88	2.47
0.900	9.42	1.900	8.20	2.900	3.67	3.90	2.47
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
0.933	9.42	1.933	8.20	2.933	3.67	3.93	2.47
0.950	9.42	1.950	8.20	2.950	3.67	3.95	2.47
0.967	9.42	1.967	8.20	2.967	3.67	3.97	2.47
0.983	9.42	1.983	8.20	2.983	3.67	3.98	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.141 (i)
TIME TO PEAK (hrs)= 2.583
RUNOFF VOLUME (mm)= 8.141
TOTAL RAINFALL (mm)= 46.257
RUNOFF COEFFICIENT = 0.176

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   0.75
|ID= 1 DT= 1.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  74.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.68         0.08
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      70.71        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    2.85 | 1.017   22.78 | 2.017    6.71 |  3.02    3.38
               0.033    2.85 | 1.033   22.78 | 2.033    6.71 |  3.03    3.38
               0.050    2.85 | 1.050   22.78 | 2.050    6.71 |  3.05    3.38
               0.067    2.85 | 1.067   22.78 | 2.067    6.71 |  3.07    3.38
               0.083    2.85 | 1.083   22.78 | 2.083    6.71 |  3.08    3.38
               0.100    2.85 | 1.100   22.78 | 2.100    6.71 |  3.10    3.38
               0.117    2.85 | 1.117   22.78 | 2.117    6.71 |  3.12    3.38
               0.133    2.85 | 1.133   22.78 | 2.133    6.71 |  3.13    3.38
               0.150    2.85 | 1.150   22.78 | 2.150    6.71 |  3.15    3.38
               0.167    2.85 | 1.167   22.78 | 2.167    6.71 |  3.17    3.38
               0.183    3.26 | 1.183  113.18 | 2.183    5.71 |  3.18    3.14
               0.200    3.26 | 1.200  113.18 | 2.200    5.71 |  3.20    3.14
               0.217    3.26 | 1.217  113.18 | 2.217    5.71 |  3.22    3.14
               0.233    3.26 | 1.233  113.18 | 2.233    5.71 |  3.23    3.14
               0.250    3.26 | 1.250  113.18 | 2.250    5.71 |  3.25    3.14
               0.267    3.26 | 1.267  113.18 | 2.267    5.71 |  3.27    3.14
               0.283    3.26 | 1.283  113.18 | 2.283    5.71 |  3.28    3.14
               0.300    3.26 | 1.300  113.18 | 2.300    5.71 |  3.30    3.14
               0.317    3.26 | 1.317  113.18 | 2.317    5.71 |  3.32    3.14
               0.333    3.26 | 1.333  113.18 | 2.333    5.71 |  3.33    3.14
               0.350    3.84 | 1.350   30.05 | 2.350    4.99 |  3.35    2.94
               0.367    3.84 | 1.367   30.05 | 2.367    4.99 |  3.37    2.94
               0.383    3.84 | 1.383   30.05 | 2.383    4.99 |  3.38    2.94
               0.400    3.84 | 1.400   30.05 | 2.400    4.99 |  3.40    2.94
               0.417    3.84 | 1.417   30.05 | 2.417    4.99 |  3.42    2.94
               0.433    3.84 | 1.433   30.05 | 2.433    4.99 |  3.43    2.94
               0.450    3.84 | 1.450   30.05 | 2.450    4.99 |  3.45    2.94
               0.467    3.84 | 1.467   30.05 | 2.467    4.99 |  3.47    2.94
               0.483    3.84 | 1.483   30.05 | 2.483    4.99 |  3.48    2.94
               0.500    3.84 | 1.500   30.05 | 2.500    4.99 |  3.50    2.94
               0.517    4.71 | 1.517   15.53 | 2.517    4.45 |  3.52    2.76
               0.533    4.71 | 1.533   15.53 | 2.533    4.45 |  3.53    2.76
               0.550    4.71 | 1.550   15.53 | 2.550    4.45 |  3.55    2.76
               0.567    4.71 | 1.567   15.53 | 2.567    4.45 |  3.57    2.76
               0.583    4.71 | 1.583   15.53 | 2.583    4.45 |  3.58    2.76
               0.600    4.71 | 1.600   15.53 | 2.600    4.45 |  3.60    2.76
               0.617    4.71 | 1.617   15.53 | 2.617    4.45 |  3.62    2.76
               0.633    4.71 | 1.633   15.53 | 2.633    4.45 |  3.63    2.76
               0.650    4.71 | 1.650   15.53 | 2.650    4.45 |  3.65    2.76
               0.667    4.71 | 1.667   15.53 | 2.667    4.45 |  3.67    2.76
               0.683    6.21 | 1.683   10.66 | 2.683    4.02 |  3.68    2.61
               0.700    6.21 | 1.700   10.66 | 2.700    4.02 |  3.70    2.60
               0.717    6.21 | 1.717   10.66 | 2.717    4.02 |  3.72    2.60
               0.733    6.21 | 1.733   10.66 | 2.733    4.02 |  3.73    2.60
               0.750    6.21 | 1.750   10.66 | 2.750    4.02 |  3.75    2.60
               0.767    6.21 | 1.767   10.66 | 2.767    4.02 |  3.77    2.60
               0.783    6.21 | 1.783   10.66 | 2.783    4.02 |  3.78    2.60
               0.800    6.21 | 1.800   10.66 | 2.800    4.02 |  3.80    2.60
               0.817    6.21 | 1.817   10.66 | 2.817    4.02 |  3.82    2.60
               0.833    6.21 | 1.833   10.66 | 2.833    4.02 |  3.83    2.60
               0.850    9.42 | 1.850    8.20 | 2.850    3.67 |  3.85    2.47
               0.867    9.42 | 1.867    8.20 | 2.867    3.67 |  3.87    2.47
               0.883    9.42 | 1.883    8.20 | 2.883    3.67 |  3.88    2.47
               0.900    9.42 | 1.900    8.20 | 2.900    3.67 |  3.90    2.47
               0.917    9.42 | 1.917    8.20 | 2.917    3.67 |  3.92    2.47
               0.933    9.42 | 1.933    8.20 | 2.933    3.67 |  3.93    2.47
               0.950    9.42 | 1.950    8.20 | 2.950    3.67 |  3.95    2.47
               0.967    9.42 | 1.967    8.20 | 2.967    3.67 |  3.97    2.47
               0.983    9.42 | 1.983    8.20 | 2.983    3.67 |  3.98    2.47
               1.000    9.42 | 2.000    8.20 | 3.000    3.67 |  4.00    2.47
```

```
     Max.Eff.Inten.(mm/hr)=     113.18        69.91
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.97 (ii)    4.99 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.38         0.23
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.01          0.182 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.37           1.33
     RUNOFF VOLUME    (mm)=      45.26        12.72          36.79
     TOTAL RAINFALL   (mm)=      46.26        46.26          46.26
     RUNOFF COEFFICIENT   =       0.98         0.28           0.80


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0011)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0912      0.0179
                          0.0006     0.0005   |   0.1027      0.0204
                          0.0062     0.0056   |   0.1264      0.0248
                          0.0100     0.0060   |   0.1349      0.0263
                          0.0470     0.0101   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0006)      0.750      0.182      1.33      36.79
   OUTFLOW: ID= 1 (  0011)      0.750      0.062      1.48      36.51

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 34.10
                  TIME SHIFT OF PEAK FLOW         (min)=  9.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0128

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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    2.85 | 1.017   22.78 | 2.017    6.71 |  3.02    3.38
               0.033    2.85 | 1.033   22.78 | 2.033    6.71 |  3.03    3.38
               0.050    2.85 | 1.050   22.78 | 2.050    6.71 |  3.05    3.38
               0.067    2.85 | 1.067   22.78 | 2.067    6.71 |  3.07    3.38
               0.083    2.85 | 1.083   22.78 | 2.083    6.71 |  3.08    3.38
               0.100    2.85 | 1.100   22.78 | 2.100    6.71 |  3.10    3.38
               0.117    2.85 | 1.117   22.78 | 2.117    6.71 |  3.12    3.38
               0.133    2.85 | 1.133   22.78 | 2.133    6.71 |  3.13    3.38
               0.150    2.85 | 1.150   22.78 | 2.150    6.71 |  3.15    3.38
               0.167    2.85 | 1.167   22.78 | 2.167    6.71 |  3.17    3.38
               0.183    3.26 | 1.183  113.18 | 2.183    5.71 |  3.18    3.14
               0.200    3.26 | 1.200  113.18 | 2.200    5.71 |  3.20    3.14
               0.217    3.26 | 1.217  113.18 | 2.217    5.71 |  3.22    3.14
               0.233    3.26 | 1.233  113.18 | 2.233    5.71 |  3.23    3.14
               0.250    3.26 | 1.250  113.18 | 2.250    5.71 |  3.25    3.14
               0.267    3.26 | 1.267  113.18 | 2.267    5.71 |  3.27    3.14
               0.283    3.26 | 1.283  113.18 | 2.283    5.71 |  3.28    3.14
               0.300    3.26 | 1.300  113.18 | 2.300    5.71 |  3.30    3.14
               0.317    3.26 | 1.317  113.18 | 2.317    5.71 |  3.32    3.14
```

0.333	3.26	1.333	113.18	2.333	5.71	3.33	3.14
0.350	3.84	1.350	30.05	2.350	4.99	3.35	2.94
0.367	3.84	1.367	30.05	2.367	4.99	3.37	2.94
0.383	3.84	1.383	30.05	2.383	4.99	3.38	2.94
0.400	3.84	1.400	30.05	2.400	4.99	3.40	2.94
0.417	3.84	1.417	30.05	2.417	4.99	3.42	2.94
0.433	3.84	1.433	30.05	2.433	4.99	3.43	2.94
0.450	3.84	1.450	30.05	2.450	4.99	3.45	2.94
0.467	3.84	1.467	30.05	2.467	4.99	3.47	2.94
0.483	3.84	1.483	30.05	2.483	4.99	3.48	2.94
0.500	3.84	1.500	30.05	2.500	4.99	3.50	2.94
0.517	4.71	1.517	15.53	2.517	4.45	3.52	2.76
0.533	4.71	1.533	15.53	2.533	4.45	3.53	2.76
0.550	4.71	1.550	15.53	2.550	4.45	3.55	2.76
0.567	4.71	1.567	15.53	2.567	4.45	3.57	2.76
0.583	4.71	1.583	15.53	2.583	4.45	3.58	2.76
0.600	4.71	1.600	15.53	2.600	4.45	3.60	2.76
0.617	4.71	1.617	15.53	2.617	4.45	3.62	2.76
0.633	4.71	1.633	15.53	2.633	4.45	3.63	2.76
0.650	4.71	1.650	15.53	2.650	4.45	3.65	2.76
0.667	4.71	1.667	15.53	2.667	4.45	3.67	2.76
0.683	6.21	1.683	10.66	2.683	4.02	3.68	2.61
0.700	6.21	1.700	10.66	2.700	4.02	3.70	2.60
0.717	6.21	1.717	10.66	2.717	4.02	3.72	2.60
0.733	6.21	1.733	10.66	2.733	4.02	3.73	2.60
0.750	6.21	1.750	10.66	2.750	4.02	3.75	2.60
0.767	6.21	1.767	10.66	2.767	4.02	3.77	2.60
0.783	6.21	1.783	10.66	2.783	4.02	3.78	2.60
0.800	6.21	1.800	10.66	2.800	4.02	3.80	2.60
0.817	6.21	1.817	10.66	2.817	4.02	3.82	2.60
0.833	6.21	1.833	10.66	2.833	4.02	3.83	2.60
0.850	9.42	1.850	8.20	2.850	3.67	3.85	2.47
0.867	9.42	1.867	8.20	2.867	3.67	3.87	2.47
0.883	9.42	1.883	8.20	2.883	3.67	3.88	2.47
0.900	9.42	1.900	8.20	2.900	3.67	3.90	2.47
0.917	9.42	1.917	8.20	2.917	3.67	3.92	2.47
0.933	9.42	1.933	8.20	2.933	3.67	3.93	2.47
0.950	9.42	1.950	8.20	2.950	3.67	3.95	2.47
0.967	9.42	1.967	8.20	2.967	3.67	3.97	2.47
0.983	9.42	1.983	8.20	2.983	3.67	3.98	2.47
1.000	9.42	2.000	8.20	3.000	3.67	4.00	2.47

Max.Eff.Inten.(mm/hr)=	113.18	18.52		
over (min)	5.00	10.00		
Storage Coeff. (min)=	2.73 (ii)	9.20 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.32	0.12		
			TOTALS	
PEAK FLOW (cms)=	0.29	0.03	0.310 (iii)	
TIME TO PEAK (hrs)=	1.33	1.47	1.33	
RUNOFF VOLUME (mm)=	45.26	7.06	24.25	
TOTAL RAINFALL (mm)=	46.26	46.26	46.26	
RUNOFF COEFFICIENT =	0.98	0.15	0.52	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)	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	0.0570	0.0442
	0.0008	0.0012	0.0640	0.0503
	0.0063	0.0138	0.0780	0.0611
	0.0090	0.0149	0.0830	0.0649
	0.0320	0.0249	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)	2.200	0.310	1.33	24.25
OUTFLOW: ID= 1 (0010)	2.200	0.041	1.87	24.08

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.35

```
                  TIME SHIFT OF PEAK FLOW         (min)= 32.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0321

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0039)|   Area    (ha)=   0.08
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.04
     Dep. Storage     (mm)=       1.00         2.30
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      23.09        40.00
     Mannings n             =     0.013        0.250

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.85 | 1.083   22.78 | 2.083    6.71 |  3.08    3.38
               0.167    2.85 | 1.167   22.78 | 2.167    6.71 |  3.17    3.38
               0.250    3.26 | 1.250  113.18 | 2.250    5.71 |  3.25    3.14
               0.333    3.26 | 1.333  113.18 | 2.333    5.71 |  3.33    3.14
               0.417    3.84 | 1.417   30.05 | 2.417    4.99 |  3.42    2.94
               0.500    3.84 | 1.500   30.05 | 2.500    4.99 |  3.50    2.94
               0.583    4.71 | 1.583   15.53 | 2.583    4.45 |  3.58    2.76
               0.667    4.71 | 1.667   15.53 | 2.667    4.45 |  3.67    2.76
               0.750    6.21 | 1.750   10.66 | 2.750    4.02 |  3.75    2.60
               0.833    6.21 | 1.833   10.66 | 2.833    4.02 |  3.83    2.60
               0.917    9.42 | 1.917    8.20 | 2.917    3.67 |  3.92    2.47
               1.000    9.42 | 2.000    8.20 | 3.000    3.67 |  4.00    2.47

     Max.Eff.Inten.(mm/hr)=     113.18       116.65
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.01 (ii)    7.64 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.017 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      45.26        34.75          38.37
     TOTAL RAINFALL   (mm)=      46.26        46.26          46.26
     RUNOFF COEFFICIENT   =       0.98         0.75           0.83

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  94.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.20   0.041     1.87    24.08
      + ID2= 2 (  0011):     0.75   0.062     1.48    36.51
        ====================================================
        ID = 3 (  0004):     2.95   0.099     1.55    27.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):     2.95   0.099     1.55    27.24
      + ID2= 2 (  0027):    16.11   0.141     2.58     8.14
        ================================================
        ID = 1 (  0004):    19.06   0.194     2.42    11.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    19.06   0.194     2.42    11.10
     + ID2= 2 (  0003):     4.63   0.013     4.08    13.71
       ================================================
       ID = 3 (  0004):    23.69   0.205     2.42    11.61

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):    23.69   0.205     2.42    11.61
     + ID2= 2 (  0039):     0.08   0.017     1.33    38.37
       ================================================
       ID = 1 (  0004):    23.77   0.206     2.42    11.70

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    23.77   0.206     2.42    11.70
     + ID2= 2 (  0009):     2.02   0.038     1.85    23.78
       ================================================
       ID = 3 (  0004):    25.79   0.234     2.27    12.64

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  **********************************************
  ** SIMULATION : Run 03                       **
  **********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1021.000
| Ptotal= 54.13 mm |                          B=   3.000
--------------------                          C=   0.787
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    3.43 |  1.17   25.32 |  2.17    7.85 |  3.17    4.06
                0.33    3.92 |  1.33  135.63 |  2.33    6.73 |  3.33    3.78
                0.50    4.59 |  1.50   33.17 |  2.50    5.91 |  3.50    3.54
                0.67    5.59 |  1.67   17.50 |  2.67    5.29 |  3.67    3.33
                0.83    7.28 |  1.83   12.21 |  2.83    4.79 |  3.83    3.15
                1.00   10.84 |  2.00    9.50 |  3.00    4.39 |  4.00    2.99


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

        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    3.43 | 1.017   25.32 | 2.017    7.85 |  3.02    4.06
               0.033    3.43 | 1.033   25.32 | 2.033    7.85 |  3.03    4.06
               0.050    3.43 | 1.050   25.32 | 2.050    7.85 |  3.05    4.06
               0.067    3.43 | 1.067   25.32 | 2.067    7.85 |  3.07    4.06
               0.083    3.43 | 1.083   25.32 | 2.083    7.85 |  3.08    4.06
```

0.100	3.43	1.100	25.32	2.100	7.85	3.10	4.06
0.117	3.43	1.117	25.32	2.117	7.85	3.12	4.06
0.133	3.43	1.133	25.32	2.133	7.85	3.13	4.06
0.150	3.43	1.150	25.32	2.150	7.85	3.15	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.183	3.92	1.183	135.63	2.183	6.73	3.18	3.78
0.200	3.92	1.200	135.63	2.200	6.73	3.20	3.78
0.217	3.92	1.217	135.63	2.217	6.73	3.22	3.78
0.233	3.92	1.233	135.63	2.233	6.73	3.23	3.78
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.267	3.92	1.267	135.63	2.267	6.73	3.27	3.78
0.283	3.92	1.283	135.63	2.283	6.73	3.28	3.78
0.300	3.92	1.300	135.63	2.300	6.73	3.30	3.78
0.317	3.92	1.317	135.63	2.317	6.73	3.32	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.350	4.59	1.350	33.17	2.350	5.91	3.35	3.54
0.367	4.59	1.367	33.17	2.367	5.91	3.37	3.54
0.383	4.59	1.383	33.17	2.383	5.91	3.38	3.54
0.400	4.59	1.400	33.17	2.400	5.91	3.40	3.54
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.433	4.59	1.433	33.17	2.433	5.91	3.43	3.54
0.450	4.59	1.450	33.17	2.450	5.91	3.45	3.54
0.467	4.59	1.467	33.17	2.467	5.91	3.47	3.54
0.483	4.59	1.483	33.17	2.483	5.91	3.48	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.517	5.59	1.517	17.50	2.517	5.29	3.52	3.33
0.533	5.59	1.533	17.50	2.533	5.29	3.53	3.33
0.550	5.59	1.550	17.50	2.550	5.29	3.55	3.33
0.567	5.59	1.567	17.50	2.567	5.29	3.57	3.33
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.600	5.59	1.600	17.50	2.600	5.29	3.60	3.33
0.617	5.59	1.617	17.50	2.617	5.29	3.62	3.33
0.633	5.59	1.633	17.50	2.633	5.29	3.63	3.33
0.650	5.59	1.650	17.50	2.650	5.29	3.65	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.683	7.28	1.683	12.21	2.683	4.79	3.68	3.15
0.700	7.28	1.700	12.21	2.700	4.79	3.70	3.15
0.717	7.28	1.717	12.21	2.717	4.79	3.72	3.15
0.733	7.28	1.733	12.21	2.733	4.79	3.73	3.15
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.767	7.28	1.767	12.21	2.767	4.79	3.77	3.15
0.783	7.28	1.783	12.21	2.783	4.79	3.78	3.15
0.800	7.28	1.800	12.21	2.800	4.79	3.80	3.15
0.817	7.28	1.817	12.21	2.817	4.79	3.82	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.850	10.84	1.850	9.50	2.850	4.39	3.85	2.99
0.867	10.84	1.867	9.50	2.867	4.39	3.87	2.99
0.883	10.84	1.883	9.50	2.883	4.39	3.88	2.99
0.900	10.84	1.900	9.50	2.900	4.39	3.90	2.99
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
0.933	10.84	1.933	9.50	2.933	4.39	3.93	2.99
0.950	10.84	1.950	9.50	2.950	4.39	3.95	2.99
0.967	10.84	1.967	9.50	2.967	4.39	3.97	2.99
0.983	10.84	1.983	9.50	2.983	4.39	3.98	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.044 (i)
TIME TO PEAK (hrs)= 1.717
RUNOFF VOLUME (mm)= 13.855
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.256

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

CALIB	
STANDHYD (0001)	Area (ha)= 2.91
ID= 1 DT= 1.0 min	Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	3.43	1.017	25.32	2.017	7.85	3.02	4.06
0.033	3.43	1.033	25.32	2.033	7.85	3.03	4.06
0.050	3.43	1.050	25.32	2.050	7.85	3.05	4.06
0.067	3.43	1.067	25.32	2.067	7.85	3.07	4.06
0.083	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.100	3.43	1.100	25.32	2.100	7.85	3.10	4.06
0.117	3.43	1.117	25.32	2.117	7.85	3.12	4.06
0.133	3.43	1.133	25.32	2.133	7.85	3.13	4.06
0.150	3.43	1.150	25.32	2.150	7.85	3.15	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.183	3.92	1.183	135.63	2.183	6.73	3.18	3.78
0.200	3.92	1.200	135.63	2.200	6.73	3.20	3.78
0.217	3.92	1.217	135.63	2.217	6.73	3.22	3.78
0.233	3.92	1.233	135.63	2.233	6.73	3.23	3.78
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.267	3.92	1.267	135.63	2.267	6.73	3.27	3.78
0.283	3.92	1.283	135.63	2.283	6.73	3.28	3.78
0.300	3.92	1.300	135.63	2.300	6.73	3.30	3.78
0.317	3.92	1.317	135.63	2.317	6.73	3.32	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.350	4.59	1.350	33.17	2.350	5.91	3.35	3.54
0.367	4.59	1.367	33.17	2.367	5.91	3.37	3.54
0.383	4.59	1.383	33.17	2.383	5.91	3.38	3.54
0.400	4.59	1.400	33.17	2.400	5.91	3.40	3.54
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.433	4.59	1.433	33.17	2.433	5.91	3.43	3.54
0.450	4.59	1.450	33.17	2.450	5.91	3.45	3.54
0.467	4.59	1.467	33.17	2.467	5.91	3.47	3.54
0.483	4.59	1.483	33.17	2.483	5.91	3.48	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.517	5.59	1.517	17.50	2.517	5.29	3.52	3.33
0.533	5.59	1.533	17.50	2.533	5.29	3.53	3.33
0.550	5.59	1.550	17.50	2.550	5.29	3.55	3.33
0.567	5.59	1.567	17.50	2.567	5.29	3.57	3.33
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.600	5.59	1.600	17.50	2.600	5.29	3.60	3.33
0.617	5.59	1.617	17.50	2.617	5.29	3.62	3.33
0.633	5.59	1.633	17.50	2.633	5.29	3.63	3.33
0.650	5.59	1.650	17.50	2.650	5.29	3.65	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.683	7.28	1.683	12.21	2.683	4.79	3.68	3.15
0.700	7.28	1.700	12.21	2.700	4.79	3.70	3.15
0.717	7.28	1.717	12.21	2.717	4.79	3.72	3.15
0.733	7.28	1.733	12.21	2.733	4.79	3.73	3.15
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.767	7.28	1.767	12.21	2.767	4.79	3.77	3.15
0.783	7.28	1.783	12.21	2.783	4.79	3.78	3.15
0.800	7.28	1.800	12.21	2.800	4.79	3.80	3.15
0.817	7.28	1.817	12.21	2.817	4.79	3.82	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.850	10.84	1.850	9.50	2.850	4.39	3.85	2.99
0.867	10.84	1.867	9.50	2.867	4.39	3.87	2.99
0.883	10.84	1.883	9.50	2.883	4.39	3.88	2.99
0.900	10.84	1.900	9.50	2.900	4.39	3.90	2.99
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
0.933	10.84	1.933	9.50	2.933	4.39	3.93	2.99
0.950	10.84	1.950	9.50	2.950	4.39	3.95	2.99
0.967	10.84	1.967	9.50	2.967	4.39	3.97	2.99
0.983	10.84	1.983	9.50	2.983	4.39	3.98	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

Max.Eff.Inten.(mm/hr)=	135.63	17.90		
over (min)	5.00	8.00		
Storage Coeff. (min)=	2.44 (ii)	7.66 (ii)		
Unit Hyd. Tpeak (min)=	5.00	8.00		
Unit Hyd. peak (cms)=	0.34	0.15		
			TOTALS	
PEAK FLOW (cms)=	0.54	0.05	0.566 (iii)	
TIME TO PEAK (hrs)=	1.33	1.43	1.33	
RUNOFF VOLUME (mm)=	53.13	8.03	31.03	
TOTAL RAINFALL (mm)=	54.13	54.13	54.13	
RUNOFF COEFFICIENT =	0.98	0.15	0.57	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0028)	Area (ha)= 0.29
ID= 1 DT= 1.0 min	Total Imp(%)= 67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	3.43	1.017	25.32	2.017	7.85	3.02	4.06
0.033	3.43	1.033	25.32	2.033	7.85	3.03	4.06
0.050	3.43	1.050	25.32	2.050	7.85	3.05	4.06
0.067	3.43	1.067	25.32	2.067	7.85	3.07	4.06
0.083	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.100	3.43	1.100	25.32	2.100	7.85	3.10	4.06
0.117	3.43	1.117	25.32	2.117	7.85	3.12	4.06
0.133	3.43	1.133	25.32	2.133	7.85	3.13	4.06
0.150	3.43	1.150	25.32	2.150	7.85	3.15	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.183	3.92	1.183	135.63	2.183	6.73	3.18	3.78
0.200	3.92	1.200	135.63	2.200	6.73	3.20	3.78
0.217	3.92	1.217	135.63	2.217	6.73	3.22	3.78
0.233	3.92	1.233	135.63	2.233	6.73	3.23	3.78
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.267	3.92	1.267	135.63	2.267	6.73	3.27	3.78
0.283	3.92	1.283	135.63	2.283	6.73	3.28	3.78
0.300	3.92	1.300	135.63	2.300	6.73	3.30	3.78
0.317	3.92	1.317	135.63	2.317	6.73	3.32	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.350	4.59	1.350	33.17	2.350	5.91	3.35	3.54
0.367	4.59	1.367	33.17	2.367	5.91	3.37	3.54
0.383	4.59	1.383	33.17	2.383	5.91	3.38	3.54
0.400	4.59	1.400	33.17	2.400	5.91	3.40	3.54
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.433	4.59	1.433	33.17	2.433	5.91	3.43	3.54
0.450	4.59	1.450	33.17	2.450	5.91	3.45	3.54
0.467	4.59	1.467	33.17	2.467	5.91	3.47	3.54
0.483	4.59	1.483	33.17	2.483	5.91	3.48	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.517	5.59	1.517	17.50	2.517	5.29	3.52	3.33
0.533	5.59	1.533	17.50	2.533	5.29	3.53	3.33
0.550	5.59	1.550	17.50	2.550	5.29	3.55	3.33
0.567	5.59	1.567	17.50	2.567	5.29	3.57	3.33
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.600	5.59	1.600	17.50	2.600	5.29	3.60	3.33
0.617	5.59	1.617	17.50	2.617	5.29	3.62	3.33
0.633	5.59	1.633	17.50	2.633	5.29	3.63	3.33
0.650	5.59	1.650	17.50	2.650	5.29	3.65	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.683	7.28	1.683	12.21	2.683	4.79	3.68	3.15
0.700	7.28	1.700	12.21	2.700	4.79	3.70	3.15
0.717	7.28	1.717	12.21	2.717	4.79	3.72	3.15
0.733	7.28	1.733	12.21	2.733	4.79	3.73	3.15
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.767	7.28	1.767	12.21	2.767	4.79	3.77	3.15
0.783	7.28	1.783	12.21	2.783	4.79	3.78	3.15
0.800	7.28	1.800	12.21	2.800	4.79	3.80	3.15
0.817	7.28	1.817	12.21	2.817	4.79	3.82	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.850	10.84	1.850	9.50	2.850	4.39	3.85	2.99
0.867	10.84	1.867	9.50	2.867	4.39	3.87	2.99
0.883	10.84	1.883	9.50	2.883	4.39	3.88	2.99

```
               0.900   10.84 | 1.900    9.50 | 2.900    4.39 |  3.90    2.99
               0.917   10.84 | 1.917    9.50 | 2.917    4.39 |  3.92    2.99
               0.933   10.84 | 1.933    9.50 | 2.933    4.39 |  3.93    2.99
               0.950   10.84 | 1.950    9.50 | 2.950    4.39 |  3.95    2.99
               0.967   10.84 | 1.967    9.50 | 2.967    4.39 |  3.97    2.99
               0.983   10.84 | 1.983    9.50 | 2.983    4.39 |  3.98    2.99
               1.000   10.84 | 2.000    9.50 | 3.000    4.39 |  4.00    2.99

     Max.Eff.Inten.(mm/hr)=     135.63        14.18
               over (min)        5.00         7.00
     Storage Coeff.  (min)=       1.38 (ii)    6.09 (ii)
     Unit Hyd. Tpeak (min)=       5.00         7.00
     Unit Hyd. peak  (cms)=       0.43         0.18
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.00          0.075 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.40           1.33
     RUNOFF VOLUME    (mm)=      53.13         7.19          37.96
     TOTAL RAINFALL   (mm)=      54.13        54.13          54.13
     RUNOFF COEFFICIENT   =       0.98         0.13           0.70


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.91   0.566     1.33    31.03
      + ID2= 2 (  0025):     1.43   0.044     1.72    13.86
        ================================================
        ID = 3 (  0016):     4.34   0.574     1.33    25.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.574     1.33    25.37
      + ID2= 2 (  0028):     0.29   0.075     1.33    37.96
        ================================================
        ID = 1 (  0016):     4.63   0.649     1.33    26.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0130      0.0895
                          0.0000     0.0291   |   0.0210      0.1555
                          0.0010     0.0332   |   0.0230      0.1780
                          0.0040     0.0496   |   0.0280      0.2176
                          0.0050     0.0537   |   0.0300      0.2309

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0016)     4.630      0.649      1.33      26.16
   OUTFLOW: ID= 1 (  0003)     4.630      0.015      4.08      17.90

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.33
                  TIME SHIFT OF PEAK FLOW         (min)=165.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1071

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0026)|   Area    (ha)=   0.27   Curve Number   (CN)= 71.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   3.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.02
```

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	3.43	1.017	25.32	2.017	7.85	3.02	4.06
0.033	3.43	1.033	25.32	2.033	7.85	3.03	4.06
0.050	3.43	1.050	25.32	2.050	7.85	3.05	4.06
0.067	3.43	1.067	25.32	2.067	7.85	3.07	4.06
0.083	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.100	3.43	1.100	25.32	2.100	7.85	3.10	4.06
0.117	3.43	1.117	25.32	2.117	7.85	3.12	4.06
0.133	3.43	1.133	25.32	2.133	7.85	3.13	4.06
0.150	3.43	1.150	25.32	2.150	7.85	3.15	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.183	3.92	1.183	135.63	2.183	6.73	3.18	3.78
0.200	3.92	1.200	135.63	2.200	6.73	3.20	3.78
0.217	3.92	1.217	135.63	2.217	6.73	3.22	3.78
0.233	3.92	1.233	135.63	2.233	6.73	3.23	3.78
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.267	3.92	1.267	135.63	2.267	6.73	3.27	3.78
0.283	3.92	1.283	135.63	2.283	6.73	3.28	3.78
0.300	3.92	1.300	135.63	2.300	6.73	3.30	3.78
0.317	3.92	1.317	135.63	2.317	6.73	3.32	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.350	4.59	1.350	33.17	2.350	5.91	3.35	3.54
0.367	4.59	1.367	33.17	2.367	5.91	3.37	3.54
0.383	4.59	1.383	33.17	2.383	5.91	3.38	3.54
0.400	4.59	1.400	33.17	2.400	5.91	3.40	3.54
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.433	4.59	1.433	33.17	2.433	5.91	3.43	3.54
0.450	4.59	1.450	33.17	2.450	5.91	3.45	3.54
0.467	4.59	1.467	33.17	2.467	5.91	3.47	3.54
0.483	4.59	1.483	33.17	2.483	5.91	3.48	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.517	5.59	1.517	17.50	2.517	5.29	3.52	3.33
0.533	5.59	1.533	17.50	2.533	5.29	3.53	3.33
0.550	5.59	1.550	17.50	2.550	5.29	3.55	3.33
0.567	5.59	1.567	17.50	2.567	5.29	3.57	3.33
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.600	5.59	1.600	17.50	2.600	5.29	3.60	3.33
0.617	5.59	1.617	17.50	2.617	5.29	3.62	3.33
0.633	5.59	1.633	17.50	2.633	5.29	3.63	3.33
0.650	5.59	1.650	17.50	2.650	5.29	3.65	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.683	7.28	1.683	12.21	2.683	4.79	3.68	3.15
0.700	7.28	1.700	12.21	2.700	4.79	3.70	3.15
0.717	7.28	1.717	12.21	2.717	4.79	3.72	3.15
0.733	7.28	1.733	12.21	2.733	4.79	3.73	3.15
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.767	7.28	1.767	12.21	2.767	4.79	3.77	3.15
0.783	7.28	1.783	12.21	2.783	4.79	3.78	3.15
0.800	7.28	1.800	12.21	2.800	4.79	3.80	3.15
0.817	7.28	1.817	12.21	2.817	4.79	3.82	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.850	10.84	1.850	9.50	2.850	4.39	3.85	2.99
0.867	10.84	1.867	9.50	2.867	4.39	3.87	2.99
0.883	10.84	1.883	9.50	2.883	4.39	3.88	2.99
0.900	10.84	1.900	9.50	2.900	4.39	3.90	2.99
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
0.933	10.84	1.933	9.50	2.933	4.39	3.93	2.99
0.950	10.84	1.950	9.50	2.950	4.39	3.95	2.99
0.967	10.84	1.967	9.50	2.967	4.39	3.97	2.99
0.983	10.84	1.983	9.50	2.983	4.39	3.98	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.036 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 16.443
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.304

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

CALIB	
STANDHYD (0007)	Area (ha)= 1.75
ID= 1 DT= 1.0 min	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	3.43	1.017	25.32	2.017	7.85	3.02	4.06
0.033	3.43	1.033	25.32	2.033	7.85	3.03	4.06
0.050	3.43	1.050	25.32	2.050	7.85	3.05	4.06
0.067	3.43	1.067	25.32	2.067	7.85	3.07	4.06
0.083	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.100	3.43	1.100	25.32	2.100	7.85	3.10	4.06
0.117	3.43	1.117	25.32	2.117	7.85	3.12	4.06
0.133	3.43	1.133	25.32	2.133	7.85	3.13	4.06
0.150	3.43	1.150	25.32	2.150	7.85	3.15	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.183	3.92	1.183	135.63	2.183	6.73	3.18	3.78
0.200	3.92	1.200	135.63	2.200	6.73	3.20	3.78
0.217	3.92	1.217	135.63	2.217	6.73	3.22	3.78
0.233	3.92	1.233	135.63	2.233	6.73	3.23	3.78
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.267	3.92	1.267	135.63	2.267	6.73	3.27	3.78
0.283	3.92	1.283	135.63	2.283	6.73	3.28	3.78
0.300	3.92	1.300	135.63	2.300	6.73	3.30	3.78
0.317	3.92	1.317	135.63	2.317	6.73	3.32	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.350	4.59	1.350	33.17	2.350	5.91	3.35	3.54
0.367	4.59	1.367	33.17	2.367	5.91	3.37	3.54
0.383	4.59	1.383	33.17	2.383	5.91	3.38	3.54
0.400	4.59	1.400	33.17	2.400	5.91	3.40	3.54
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.433	4.59	1.433	33.17	2.433	5.91	3.43	3.54
0.450	4.59	1.450	33.17	2.450	5.91	3.45	3.54
0.467	4.59	1.467	33.17	2.467	5.91	3.47	3.54
0.483	4.59	1.483	33.17	2.483	5.91	3.48	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.517	5.59	1.517	17.50	2.517	5.29	3.52	3.33
0.533	5.59	1.533	17.50	2.533	5.29	3.53	3.33
0.550	5.59	1.550	17.50	2.550	5.29	3.55	3.33
0.567	5.59	1.567	17.50	2.567	5.29	3.57	3.33
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.600	5.59	1.600	17.50	2.600	5.29	3.60	3.33
0.617	5.59	1.617	17.50	2.617	5.29	3.62	3.33
0.633	5.59	1.633	17.50	2.633	5.29	3.63	3.33
0.650	5.59	1.650	17.50	2.650	5.29	3.65	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.683	7.28	1.683	12.21	2.683	4.79	3.68	3.15
0.700	7.28	1.700	12.21	2.700	4.79	3.70	3.15
0.717	7.28	1.717	12.21	2.717	4.79	3.72	3.15
0.733	7.28	1.733	12.21	2.733	4.79	3.73	3.15
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.767	7.28	1.767	12.21	2.767	4.79	3.77	3.15
0.783	7.28	1.783	12.21	2.783	4.79	3.78	3.15
0.800	7.28	1.800	12.21	2.800	4.79	3.80	3.15
0.817	7.28	1.817	12.21	2.817	4.79	3.82	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.850	10.84	1.850	9.50	2.850	4.39	3.85	2.99
0.867	10.84	1.867	9.50	2.867	4.39	3.87	2.99
0.883	10.84	1.883	9.50	2.883	4.39	3.88	2.99
0.900	10.84	1.900	9.50	2.900	4.39	3.90	2.99
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
0.933	10.84	1.933	9.50	2.933	4.39	3.93	2.99
0.950	10.84	1.950	9.50	2.950	4.39	3.95	2.99
0.967	10.84	1.967	9.50	2.967	4.39	3.97	2.99
0.983	10.84	1.983	9.50	2.983	4.39	3.98	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

Max.Eff.Inten.(mm/hr)=	135.63	19.76	

```
               over (min)        5.00         9.00
     Storage Coeff.  (min)=      2.37 (ii)    8.15 (ii)
     Unit Hyd. Tpeak (min)=      5.00         9.00
     Unit Hyd. peak  (cms)=      0.35         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.32         0.03          0.340 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.45           1.33
     RUNOFF VOLUME    (mm)=     53.13         8.41          31.22
     TOTAL RAINFALL   (mm)=     54.13        54.13          54.13
     RUNOFF COEFFICIENT   =      0.98         0.16           0.58


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0026):     0.27   0.036     1.33    16.44
      + ID2= 2 (  0007):     1.75   0.340     1.33    31.22
        ================================================
        ID = 3 (  0018):     2.02   0.376     1.33    29.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0009)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0007   |   0.0212      0.0291
                          0.0037     0.0045   |   0.0402      0.0316
                          0.0053     0.0065   |   0.1203      0.0341
                          0.0081     0.0128   |   0.2476      0.0366
                          0.0101     0.0188   |   0.3901      0.0373
                          0.0118     0.0250   |   0.4841      0.0381
                          0.0126     0.0279   |   0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)     2.020      0.376      1.33      29.24
   OUTFLOW: ID= 1 (  0009)     2.020      0.091      1.58      28.77

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 24.13
                  TIME SHIFT OF PEAK FLOW         (min)= 15.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0332

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.95

         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    3.43 | 1.017   25.32 | 2.017    7.85 |  3.02    4.06
               0.033    3.43 | 1.033   25.32 | 2.033    7.85 |  3.03    4.06
               0.050    3.43 | 1.050   25.32 | 2.050    7.85 |  3.05    4.06
               0.067    3.43 | 1.067   25.32 | 2.067    7.85 |  3.07    4.06
               0.083    3.43 | 1.083   25.32 | 2.083    7.85 |  3.08    4.06
               0.100    3.43 | 1.100   25.32 | 2.100    7.85 |  3.10    4.06
               0.117    3.43 | 1.117   25.32 | 2.117    7.85 |  3.12    4.06
               0.133    3.43 | 1.133   25.32 | 2.133    7.85 |  3.13    4.06
               0.150    3.43 | 1.150   25.32 | 2.150    7.85 |  3.15    4.06
               0.167    3.43 | 1.167   25.32 | 2.167    7.85 |  3.17    4.06
               0.183    3.92 | 1.183  135.63 | 2.183    6.73 |  3.18    3.78
               0.200    3.92 | 1.200  135.63 | 2.200    6.73 |  3.20    3.78
               0.217    3.92 | 1.217  135.63 | 2.217    6.73 |  3.22    3.78
```

0.233	3.92	1.233	135.63	2.233	6.73	3.23	3.78
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.267	3.92	1.267	135.63	2.267	6.73	3.27	3.78
0.283	3.92	1.283	135.63	2.283	6.73	3.28	3.78
0.300	3.92	1.300	135.63	2.300	6.73	3.30	3.78
0.317	3.92	1.317	135.63	2.317	6.73	3.32	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.350	4.59	1.350	33.17	2.350	5.91	3.35	3.54
0.367	4.59	1.367	33.17	2.367	5.91	3.37	3.54
0.383	4.59	1.383	33.17	2.383	5.91	3.38	3.54
0.400	4.59	1.400	33.17	2.400	5.91	3.40	3.54
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.433	4.59	1.433	33.17	2.433	5.91	3.43	3.54
0.450	4.59	1.450	33.17	2.450	5.91	3.45	3.54
0.467	4.59	1.467	33.17	2.467	5.91	3.47	3.54
0.483	4.59	1.483	33.17	2.483	5.91	3.48	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.517	5.59	1.517	17.50	2.517	5.29	3.52	3.33
0.533	5.59	1.533	17.50	2.533	5.29	3.53	3.33
0.550	5.59	1.550	17.50	2.550	5.29	3.55	3.33
0.567	5.59	1.567	17.50	2.567	5.29	3.57	3.33
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.600	5.59	1.600	17.50	2.600	5.29	3.60	3.33
0.617	5.59	1.617	17.50	2.617	5.29	3.62	3.33
0.633	5.59	1.633	17.50	2.633	5.29	3.63	3.33
0.650	5.59	1.650	17.50	2.650	5.29	3.65	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.683	7.28	1.683	12.21	2.683	4.79	3.68	3.15
0.700	7.28	1.700	12.21	2.700	4.79	3.70	3.15
0.717	7.28	1.717	12.21	2.717	4.79	3.72	3.15
0.733	7.28	1.733	12.21	2.733	4.79	3.73	3.15
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.767	7.28	1.767	12.21	2.767	4.79	3.77	3.15
0.783	7.28	1.783	12.21	2.783	4.79	3.78	3.15
0.800	7.28	1.800	12.21	2.800	4.79	3.80	3.15
0.817	7.28	1.817	12.21	2.817	4.79	3.82	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.850	10.84	1.850	9.50	2.850	4.39	3.85	2.99
0.867	10.84	1.867	9.50	2.867	4.39	3.87	2.99
0.883	10.84	1.883	9.50	2.883	4.39	3.88	2.99
0.900	10.84	1.900	9.50	2.900	4.39	3.90	2.99
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
0.933	10.84	1.933	9.50	2.933	4.39	3.93	2.99
0.950	10.84	1.950	9.50	2.950	4.39	3.95	2.99
0.967	10.84	1.967	9.50	2.967	4.39	3.97	2.99
0.983	10.84	1.983	9.50	2.983	4.39	3.98	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.194 (i)
TIME TO PEAK (hrs)= 2.567
RUNOFF VOLUME (mm)= 11.168
TOTAL RAINFALL (mm)= 54.135
RUNOFF COEFFICIENT = 0.206

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

CALIB
STANDHYD (0006) | Area (ha)= 0.75
ID= 1 DT= 1.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	3.43	1.017	25.32	2.017	7.85	3.02	4.06
0.033	3.43	1.033	25.32	2.033	7.85	3.03	4.06

0.050	3.43	1.050	25.32	2.050	7.85	3.05	4.06
0.067	3.43	1.067	25.32	2.067	7.85	3.07	4.06
0.083	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.100	3.43	1.100	25.32	2.100	7.85	3.10	4.06
0.117	3.43	1.117	25.32	2.117	7.85	3.12	4.06
0.133	3.43	1.133	25.32	2.133	7.85	3.13	4.06
0.150	3.43	1.150	25.32	2.150	7.85	3.15	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.183	3.92	1.183	135.63	2.183	6.73	3.18	3.78
0.200	3.92	1.200	135.63	2.200	6.73	3.20	3.78
0.217	3.92	1.217	135.63	2.217	6.73	3.22	3.78
0.233	3.92	1.233	135.63	2.233	6.73	3.23	3.78
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.267	3.92	1.267	135.63	2.267	6.73	3.27	3.78
0.283	3.92	1.283	135.63	2.283	6.73	3.28	3.78
0.300	3.92	1.300	135.63	2.300	6.73	3.30	3.78
0.317	3.92	1.317	135.63	2.317	6.73	3.32	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.350	4.59	1.350	33.17	2.350	5.91	3.35	3.54
0.367	4.59	1.367	33.17	2.367	5.91	3.37	3.54
0.383	4.59	1.383	33.17	2.383	5.91	3.38	3.54
0.400	4.59	1.400	33.17	2.400	5.91	3.40	3.54
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.433	4.59	1.433	33.17	2.433	5.91	3.43	3.54
0.450	4.59	1.450	33.17	2.450	5.91	3.45	3.54
0.467	4.59	1.467	33.17	2.467	5.91	3.47	3.54
0.483	4.59	1.483	33.17	2.483	5.91	3.48	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.517	5.59	1.517	17.50	2.517	5.29	3.52	3.33
0.533	5.59	1.533	17.50	2.533	5.29	3.53	3.33
0.550	5.59	1.550	17.50	2.550	5.29	3.55	3.33
0.567	5.59	1.567	17.50	2.567	5.29	3.57	3.33
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.600	5.59	1.600	17.50	2.600	5.29	3.60	3.33
0.617	5.59	1.617	17.50	2.617	5.29	3.62	3.33
0.633	5.59	1.633	17.50	2.633	5.29	3.63	3.33
0.650	5.59	1.650	17.50	2.650	5.29	3.65	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.683	7.28	1.683	12.21	2.683	4.79	3.68	3.15
0.700	7.28	1.700	12.21	2.700	4.79	3.70	3.15
0.717	7.28	1.717	12.21	2.717	4.79	3.72	3.15
0.733	7.28	1.733	12.21	2.733	4.79	3.73	3.15
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.767	7.28	1.767	12.21	2.767	4.79	3.77	3.15
0.783	7.28	1.783	12.21	2.783	4.79	3.78	3.15
0.800	7.28	1.800	12.21	2.800	4.79	3.80	3.15
0.817	7.28	1.817	12.21	2.817	4.79	3.82	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.850	10.84	1.850	9.50	2.850	4.39	3.85	2.99
0.867	10.84	1.867	9.50	2.867	4.39	3.87	2.99
0.883	10.84	1.883	9.50	2.883	4.39	3.88	2.99
0.900	10.84	1.900	9.50	2.900	4.39	3.90	2.99
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
0.933	10.84	1.933	9.50	2.933	4.39	3.93	2.99
0.950	10.84	1.950	9.50	2.950	4.39	3.95	2.99
0.967	10.84	1.967	9.50	2.967	4.39	3.97	2.99
0.983	10.84	1.983	9.50	2.983	4.39	3.98	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

Max.Eff.Inten.(mm/hr)=	135.63	96.31	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.84 (ii)	4.64 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.39	0.24	
			TOTALS
PEAK FLOW (cms)=	0.21	0.02	0.222 (iii)
TIME TO PEAK (hrs)=	1.33	1.37	1.33
RUNOFF VOLUME (mm)=	53.13	16.79	43.68
TOTAL RAINFALL (mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT =	0.98	0.31	0.81

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| RESERVOIR(  0011)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0912      0.0179
                          0.0006     0.0005   |   0.1027      0.0204
                          0.0062     0.0056   |   0.1264      0.0248
                          0.0100     0.0060   |   0.1349      0.0263
                          0.0470     0.0101   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0006)      0.750     0.222      1.33      43.68
   OUTFLOW: ID= 1 (  0011)      0.750     0.075      1.47      43.40

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 33.75
                  TIME SHIFT OF PEAK FLOW         (min)=  8.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0150

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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    3.43 | 1.017   25.32 | 2.017    7.85 |  3.02    4.06
 0.033    3.43 | 1.033   25.32 | 2.033    7.85 |  3.03    4.06
 0.050    3.43 | 1.050   25.32 | 2.050    7.85 |  3.05    4.06
 0.067    3.43 | 1.067   25.32 | 2.067    7.85 |  3.07    4.06
 0.083    3.43 | 1.083   25.32 | 2.083    7.85 |  3.08    4.06
 0.100    3.43 | 1.100   25.32 | 2.100    7.85 |  3.10    4.06
 0.117    3.43 | 1.117   25.32 | 2.117    7.85 |  3.12    4.06
 0.133    3.43 | 1.133   25.32 | 2.133    7.85 |  3.13    4.06
 0.150    3.43 | 1.150   25.32 | 2.150    7.85 |  3.15    4.06
 0.167    3.43 | 1.167   25.32 | 2.167    7.85 |  3.17    4.06
 0.183    3.92 | 1.183  135.63 | 2.183    6.73 |  3.18    3.78
 0.200    3.92 | 1.200  135.63 | 2.200    6.73 |  3.20    3.78
 0.217    3.92 | 1.217  135.63 | 2.217    6.73 |  3.22    3.78
 0.233    3.92 | 1.233  135.63 | 2.233    6.73 |  3.23    3.78
 0.250    3.92 | 1.250  135.63 | 2.250    6.73 |  3.25    3.78
 0.267    3.92 | 1.267  135.63 | 2.267    6.73 |  3.27    3.78
 0.283    3.92 | 1.283  135.63 | 2.283    6.73 |  3.28    3.78
 0.300    3.92 | 1.300  135.63 | 2.300    6.73 |  3.30    3.78
 0.317    3.92 | 1.317  135.63 | 2.317    6.73 |  3.32    3.78
 0.333    3.92 | 1.333  135.63 | 2.333    6.73 |  3.33    3.78
 0.350    4.59 | 1.350   33.17 | 2.350    5.91 |  3.35    3.54
 0.367    4.59 | 1.367   33.17 | 2.367    5.91 |  3.37    3.54
 0.383    4.59 | 1.383   33.17 | 2.383    5.91 |  3.38    3.54
 0.400    4.59 | 1.400   33.17 | 2.400    5.91 |  3.40    3.54
 0.417    4.59 | 1.417   33.17 | 2.417    5.91 |  3.42    3.54
 0.433    4.59 | 1.433   33.17 | 2.433    5.91 |  3.43    3.54
 0.450    4.59 | 1.450   33.17 | 2.450    5.91 |  3.45    3.54
 0.467    4.59 | 1.467   33.17 | 2.467    5.91 |  3.47    3.54
 0.483    4.59 | 1.483   33.17 | 2.483    5.91 |  3.48    3.54
 0.500    4.59 | 1.500   33.17 | 2.500    5.91 |  3.50    3.54
 0.517    5.59 | 1.517   17.50 | 2.517    5.29 |  3.52    3.33
 0.533    5.59 | 1.533   17.50 | 2.533    5.29 |  3.53    3.33
 0.550    5.59 | 1.550   17.50 | 2.550    5.29 |  3.55    3.33
 0.567    5.59 | 1.567   17.50 | 2.567    5.29 |  3.57    3.33
 0.583    5.59 | 1.583   17.50 | 2.583    5.29 |  3.58    3.33
 0.600    5.59 | 1.600   17.50 | 2.600    5.29 |  3.60    3.33
 0.617    5.59 | 1.617   17.50 | 2.617    5.29 |  3.62    3.33
 0.633    5.59 | 1.633   17.50 | 2.633    5.29 |  3.63    3.33
 0.650    5.59 | 1.650   17.50 | 2.650    5.29 |  3.65    3.33
 0.667    5.59 | 1.667   17.50 | 2.667    5.29 |  3.67    3.33
```

```
                0.683    7.28 | 1.683   12.21 | 2.683    4.79 |  3.68    3.15
                0.700    7.28 | 1.700   12.21 | 2.700    4.79 |  3.70    3.15
                0.717    7.28 | 1.717   12.21 | 2.717    4.79 |  3.72    3.15
                0.733    7.28 | 1.733   12.21 | 2.733    4.79 |  3.73    3.15
                0.750    7.28 | 1.750   12.21 | 2.750    4.79 |  3.75    3.15
                0.767    7.28 | 1.767   12.21 | 2.767    4.79 |  3.77    3.15
                0.783    7.28 | 1.783   12.21 | 2.783    4.79 |  3.78    3.15
                0.800    7.28 | 1.800   12.21 | 2.800    4.79 |  3.80    3.15
                0.817    7.28 | 1.817   12.21 | 2.817    4.79 |  3.82    3.15
                0.833    7.28 | 1.833   12.21 | 2.833    4.79 |  3.83    3.15
                0.850   10.84 | 1.850    9.50 | 2.850    4.39 |  3.85    2.99
                0.867   10.84 | 1.867    9.50 | 2.867    4.39 |  3.87    2.99
                0.883   10.84 | 1.883    9.50 | 2.883    4.39 |  3.88    2.99
                0.900   10.84 | 1.900    9.50 | 2.900    4.39 |  3.90    2.99
                0.917   10.84 | 1.917    9.50 | 2.917    4.39 |  3.92    2.99
                0.933   10.84 | 1.933    9.50 | 2.933    4.39 |  3.93    2.99
                0.950   10.84 | 1.950    9.50 | 2.950    4.39 |  3.95    2.99
                0.967   10.84 | 1.967    9.50 | 2.967    4.39 |  3.97    2.99
                0.983   10.84 | 1.983    9.50 | 2.983    4.39 |  3.98    2.99
                1.000   10.84 | 2.000    9.50 | 3.000    4.39 |  4.00    2.99

     Max.Eff.Inten.(mm/hr)=     135.63        26.47
               over (min)        5.00         9.00
     Storage Coeff.  (min)=       2.54 (ii)    8.56 (ii)
     Unit Hyd. Tpeak (min)=       5.00         9.00
     Unit Hyd. peak  (cms)=       0.34         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.36         0.04          0.382 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.45           1.33
     RUNOFF VOLUME    (mm)=      53.13         9.63          29.20
     TOTAL RAINFALL   (mm)=      54.13        54.13          54.13
     RUNOFF COEFFICIENT   =       0.98         0.18           0.54


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0010)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0570      0.0442
                          0.0008     0.0012   |   0.0640      0.0503
                          0.0063     0.0138   |   0.0780      0.0611
                          0.0090     0.0149   |   0.0830      0.0649
                          0.0320     0.0249   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0008)      2.200     0.382      1.33      29.20
   OUTFLOW: ID= 1 (  0010)      2.200     0.049      1.87      29.03

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.93
                  TIME SHIFT OF PEAK FLOW         (min)= 32.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0384

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0039)|   Area    (ha)=   0.08
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.04
     Dep. Storage     (mm)=       1.00         2.30
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      23.09        40.00
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
```

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	3.43	1.083	25.32	2.083	7.85	3.08	4.06
0.167	3.43	1.167	25.32	2.167	7.85	3.17	4.06
0.250	3.92	1.250	135.63	2.250	6.73	3.25	3.78
0.333	3.92	1.333	135.63	2.333	6.73	3.33	3.78
0.417	4.59	1.417	33.17	2.417	5.91	3.42	3.54
0.500	4.59	1.500	33.17	2.500	5.91	3.50	3.54
0.583	5.59	1.583	17.50	2.583	5.29	3.58	3.33
0.667	5.59	1.667	17.50	2.667	5.29	3.67	3.33
0.750	7.28	1.750	12.21	2.750	4.79	3.75	3.15
0.833	7.28	1.833	12.21	2.833	4.79	3.83	3.15
0.917	10.84	1.917	9.50	2.917	4.39	3.92	2.99
1.000	10.84	2.000	9.50	3.000	4.39	4.00	2.99

			TOTALS
Max.Eff.Inten.(mm/hr)=	135.63	146.08	
over (min)	5.00	10.00	
Storage Coeff. (min)=	0.94 (ii)	7.00 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.14	
PEAK FLOW (cms)=	0.01	0.01	0.021 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	53.13	42.29	46.03
TOTAL RAINFALL (mm)=	54.13	54.13	54.13
RUNOFF COEFFICIENT =	0.98	0.78	0.85

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 94.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	2.20	0.049	1.87	29.03
+ ID2= 2 (0011):	0.75	0.075	1.47	43.40
ID = 3 (0004):	2.95	0.119	1.55	32.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0004):	2.95	0.119	1.55	32.68
+ ID2= 2 (0027):	16.11	0.194	2.57	11.17
ID = 1 (0004):	19.06	0.258	2.40	14.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	19.06	0.258	2.40	14.50
+ ID2= 2 (0003):	4.63	0.015	4.08	17.90
ID = 3 (0004):	23.69	0.272	2.42	15.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0004):	23.69	0.272	2.42	15.16
+ ID2= 2 (0039):	0.08	0.021	1.33	46.03

```
        ID = 1 (  0004):    23.77   0.273     2.40    15.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    23.77   0.273     2.40    15.27
      + ID2= 2 (  0009):     2.02   0.091     1.58    28.77
        ================================================
        ID = 3 (  0004):    25.79   0.305     2.30    16.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  ***********************************************
  ** SIMULATION : Run 04                       **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1100.000
| Ptotal= 62.15 mm |                          B=   2.000
--------------------                          C=   0.776
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.06 |  1.17   27.34 |  2.17    9.00 |  3.17    4.78
                0.33    4.62 |  1.33  159.94 |  2.33    7.77 |  3.33    4.46
                0.50    5.38 |  1.50   35.45 |  2.50    6.86 |  3.50    4.19
                0.67    6.51 |  1.67   19.27 |  2.67    6.16 |  3.67    3.95
                0.83    8.38 |  1.83   13.70 |  2.83    5.61 |  3.83    3.74
                1.00   12.24 |  2.00   10.80 |  3.00    5.16 |  4.00    3.55


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

         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    4.06 | 1.017   27.34 | 2.017    9.01 |  3.02    4.78
                0.033    4.06 | 1.033   27.34 | 2.033    9.00 |  3.03    4.78
                0.050    4.06 | 1.050   27.34 | 2.050    9.00 |  3.05    4.78
                0.067    4.06 | 1.067   27.34 | 2.067    9.00 |  3.07    4.78
                0.083    4.06 | 1.083   27.34 | 2.083    9.00 |  3.08    4.78
                0.100    4.06 | 1.100   27.34 | 2.100    9.00 |  3.10    4.78
                0.117    4.06 | 1.117   27.34 | 2.117    9.00 |  3.12    4.78
                0.133    4.06 | 1.133   27.34 | 2.133    9.00 |  3.13    4.78
                0.150    4.06 | 1.150   27.34 | 2.150    9.00 |  3.15    4.78
                0.167    4.06 | 1.167   27.34 | 2.167    9.00 |  3.17    4.78
                0.183    4.62 | 1.183  159.93 | 2.183    7.77 |  3.18    4.46
                0.200    4.62 | 1.200  159.94 | 2.200    7.77 |  3.20    4.46
                0.217    4.62 | 1.217  159.94 | 2.217    7.77 |  3.22    4.46
                0.233    4.62 | 1.233  159.94 | 2.233    7.77 |  3.23    4.46
                0.250    4.62 | 1.250  159.94 | 2.250    7.77 |  3.25    4.46
                0.267    4.62 | 1.267  159.94 | 2.267    7.77 |  3.27    4.46
                0.283    4.62 | 1.283  159.94 | 2.283    7.77 |  3.28    4.46
                0.300    4.62 | 1.300  159.94 | 2.300    7.77 |  3.30    4.46
                0.317    4.62 | 1.317  159.94 | 2.317    7.77 |  3.32    4.46
                0.333    4.62 | 1.333  159.94 | 2.333    7.77 |  3.33    4.46
                0.350    5.38 | 1.350   35.46 | 2.350    6.86 |  3.35    4.19
                0.367    5.38 | 1.367   35.45 | 2.367    6.86 |  3.37    4.19
                0.383    5.38 | 1.383   35.45 | 2.383    6.86 |  3.38    4.19
                0.400    5.38 | 1.400   35.45 | 2.400    6.86 |  3.40    4.19
                0.417    5.38 | 1.417   35.45 | 2.417    6.86 |  3.42    4.19
                0.433    5.38 | 1.433   35.45 | 2.433    6.86 |  3.43    4.19
```

0.450	5.38	1.450	35.45	2.450	6.86	3.45	4.19
0.467	5.38	1.467	35.45	2.467	6.86	3.47	4.19
0.483	5.38	1.483	35.45	2.483	6.86	3.48	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.517	6.51	1.517	19.27	2.517	6.16	3.52	3.95
0.533	6.51	1.533	19.27	2.533	6.16	3.53	3.95
0.550	6.51	1.550	19.27	2.550	6.16	3.55	3.95
0.567	6.51	1.567	19.27	2.567	6.16	3.57	3.95
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.058 (i)
TIME TO PEAK (hrs)= 1.717
RUNOFF VOLUME (mm)= 17.923
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.288

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

CALIB
STANDHYD (0001)
ID= 1 DT= 1.0 min

Area (ha)= 2.91
Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	4.06	1.017	27.34	2.017	9.01	3.02	4.78
0.033	4.06	1.033	27.34	2.033	9.00	3.03	4.78
0.050	4.06	1.050	27.34	2.050	9.00	3.05	4.78
0.067	4.06	1.067	27.34	2.067	9.00	3.07	4.78
0.083	4.06	1.083	27.34	2.083	9.00	3.08	4.78
0.100	4.06	1.100	27.34	2.100	9.00	3.10	4.78
0.117	4.06	1.117	27.34	2.117	9.00	3.12	4.78
0.133	4.06	1.133	27.34	2.133	9.00	3.13	4.78
0.150	4.06	1.150	27.34	2.150	9.00	3.15	4.78
0.167	4.06	1.167	27.34	2.167	9.00	3.17	4.78
0.183	4.62	1.183	159.93	2.183	7.77	3.18	4.46
0.200	4.62	1.200	159.94	2.200	7.77	3.20	4.46
0.217	4.62	1.217	159.94	2.217	7.77	3.22	4.46
0.233	4.62	1.233	159.94	2.233	7.77	3.23	4.46
0.250	4.62	1.250	159.94	2.250	7.77	3.25	4.46

0.267	4.62	1.267	159.94	2.267	7.77	3.27	4.46
0.283	4.62	1.283	159.94	2.283	7.77	3.28	4.46
0.300	4.62	1.300	159.94	2.300	7.77	3.30	4.46
0.317	4.62	1.317	159.94	2.317	7.77	3.32	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.350	5.38	1.350	35.46	2.350	6.86	3.35	4.19
0.367	5.38	1.367	35.45	2.367	6.86	3.37	4.19
0.383	5.38	1.383	35.45	2.383	6.86	3.38	4.19
0.400	5.38	1.400	35.45	2.400	6.86	3.40	4.19
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.433	5.38	1.433	35.45	2.433	6.86	3.43	4.19
0.450	5.38	1.450	35.45	2.450	6.86	3.45	4.19
0.467	5.38	1.467	35.45	2.467	6.86	3.47	4.19
0.483	5.38	1.483	35.45	2.483	6.86	3.48	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.517	6.51	1.517	19.27	2.517	6.16	3.52	3.95
0.533	6.51	1.533	19.27	2.533	6.16	3.53	3.95
0.550	6.51	1.550	19.27	2.550	6.16	3.55	3.95
0.567	6.51	1.567	19.27	2.567	6.16	3.57	3.95
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Max.Eff.Inten.(mm/hr)=	159.94	24.71		
over (min)	5.00	8.00		
Storage Coeff. (min)=	2.29 (ii)	7.17 (ii)		
Unit Hyd. Tpeak (min)=	5.00	8.00		
Unit Hyd. peak (cms)=	0.35	0.15		
			TOTALS	
PEAK FLOW (cms)=	0.64	0.06	0.679 (iii)	
TIME TO PEAK (hrs)=	1.33	1.42	1.33	
RUNOFF VOLUME (mm)=	61.15	10.56	36.36	
TOTAL RAINFALL (mm)=	62.15	62.15	62.15	
RUNOFF COEFFICIENT =	0.98	0.17	0.59	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
STANDHYD (0028)	Area (ha)=	0.29
ID= 1 DT= 1.0 min	Total Imp(%)=	67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	4.06	1.017	27.34	2.017	9.01	3.02	4.78
0.033	4.06	1.033	27.34	2.033	9.00	3.03	4.78
0.050	4.06	1.050	27.34	2.050	9.00	3.05	4.78
0.067	4.06	1.067	27.34	2.067	9.00	3.07	4.78
0.083	4.06	1.083	27.34	2.083	9.00	3.08	4.78
0.100	4.06	1.100	27.34	2.100	9.00	3.10	4.78
0.117	4.06	1.117	27.34	2.117	9.00	3.12	4.78
0.133	4.06	1.133	27.34	2.133	9.00	3.13	4.78
0.150	4.06	1.150	27.34	2.150	9.00	3.15	4.78
0.167	4.06	1.167	27.34	2.167	9.00	3.17	4.78
0.183	4.62	1.183	159.93	2.183	7.77	3.18	4.46
0.200	4.62	1.200	159.94	2.200	7.77	3.20	4.46
0.217	4.62	1.217	159.94	2.217	7.77	3.22	4.46
0.233	4.62	1.233	159.94	2.233	7.77	3.23	4.46
0.250	4.62	1.250	159.94	2.250	7.77	3.25	4.46
0.267	4.62	1.267	159.94	2.267	7.77	3.27	4.46
0.283	4.62	1.283	159.94	2.283	7.77	3.28	4.46
0.300	4.62	1.300	159.94	2.300	7.77	3.30	4.46
0.317	4.62	1.317	159.94	2.317	7.77	3.32	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.350	5.38	1.350	35.46	2.350	6.86	3.35	4.19
0.367	5.38	1.367	35.45	2.367	6.86	3.37	4.19
0.383	5.38	1.383	35.45	2.383	6.86	3.38	4.19
0.400	5.38	1.400	35.45	2.400	6.86	3.40	4.19
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.433	5.38	1.433	35.45	2.433	6.86	3.43	4.19
0.450	5.38	1.450	35.45	2.450	6.86	3.45	4.19
0.467	5.38	1.467	35.45	2.467	6.86	3.47	4.19
0.483	5.38	1.483	35.45	2.483	6.86	3.48	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.517	6.51	1.517	19.27	2.517	6.16	3.52	3.95
0.533	6.51	1.533	19.27	2.533	6.16	3.53	3.95
0.550	6.51	1.550	19.27	2.550	6.16	3.55	3.95
0.567	6.51	1.567	19.27	2.567	6.16	3.57	3.95
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Max.Eff.Inten.(mm/hr)=	159.94	19.70		
over (min)	5.00	6.00		
Storage Coeff. (min)=	1.29 (ii)	5.70 (ii)		
Unit Hyd. Tpeak (min)=	5.00	6.00		
Unit Hyd. peak (cms)=	0.44	0.19		
			TOTALS	
PEAK FLOW (cms)=	0.09	0.00	0.090 (iii)	
TIME TO PEAK (hrs)=	1.33	1.38	1.33	
RUNOFF VOLUME (mm)=	61.15	9.51	44.10	
TOTAL RAINFALL (mm)=	62.15	62.15	62.15	
RUNOFF COEFFICIENT =	0.98	0.15	0.71	

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.91   0.679     1.33    36.36
      + ID2= 2 (  0025):     1.43   0.058     1.72    17.92
        ================================================
        ID = 3 (  0016):     4.34   0.691     1.33    30.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.691     1.33    30.29
      + ID2= 2 (  0028):     0.29   0.090     1.33    44.10
        ================================================
        ID = 1 (  0016):     4.63   0.781     1.33    31.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0130      0.0895
                          0.0000     0.0291   |   0.0210      0.1555
                          0.0010     0.0332   |   0.0230      0.1780
                          0.0040     0.0496   |   0.0280      0.2176
                          0.0050     0.0537   |   0.0300      0.2309

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0016)     4.630      0.781      1.33      31.15
   OUTFLOW: ID= 1 (  0003)     4.630      0.018      4.08      22.30

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.26
                  TIME SHIFT OF PEAK FLOW         (min)=165.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1276

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0026)|   Area    (ha)=   0.27   Curve Number   (CN)= 71.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   3.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.02

         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    4.06 | 1.017   27.34 | 2.017    9.01 |  3.02    4.78
               0.033    4.06 | 1.033   27.34 | 2.033    9.00 |  3.03    4.78
               0.050    4.06 | 1.050   27.34 | 2.050    9.00 |  3.05    4.78
               0.067    4.06 | 1.067   27.34 | 2.067    9.00 |  3.07    4.78
               0.083    4.06 | 1.083   27.34 | 2.083    9.00 |  3.08    4.78
               0.100    4.06 | 1.100   27.34 | 2.100    9.00 |  3.10    4.78
               0.117    4.06 | 1.117   27.34 | 2.117    9.00 |  3.12    4.78
               0.133    4.06 | 1.133   27.34 | 2.133    9.00 |  3.13    4.78
               0.150    4.06 | 1.150   27.34 | 2.150    9.00 |  3.15    4.78
               0.167    4.06 | 1.167   27.34 | 2.167    9.00 |  3.17    4.78
               0.183    4.62 | 1.183  159.93 | 2.183    7.77 |  3.18    4.46
               0.200    4.62 | 1.200  159.94 | 2.200    7.77 |  3.20    4.46
               0.217    4.62 | 1.217  159.94 | 2.217    7.77 |  3.22    4.46
               0.233    4.62 | 1.233  159.94 | 2.233    7.77 |  3.23    4.46
               0.250    4.62 | 1.250  159.94 | 2.250    7.77 |  3.25    4.46
```

0.267	4.62	1.267	159.94	2.267	7.77	3.27	4.46
0.283	4.62	1.283	159.94	2.283	7.77	3.28	4.46
0.300	4.62	1.300	159.94	2.300	7.77	3.30	4.46
0.317	4.62	1.317	159.94	2.317	7.77	3.32	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.350	5.38	1.350	35.46	2.350	6.86	3.35	4.19
0.367	5.38	1.367	35.45	2.367	6.86	3.37	4.19
0.383	5.38	1.383	35.45	2.383	6.86	3.38	4.19
0.400	5.38	1.400	35.45	2.400	6.86	3.40	4.19
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.433	5.38	1.433	35.45	2.433	6.86	3.43	4.19
0.450	5.38	1.450	35.45	2.450	6.86	3.45	4.19
0.467	5.38	1.467	35.45	2.467	6.86	3.47	4.19
0.483	5.38	1.483	35.45	2.483	6.86	3.48	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.517	6.51	1.517	19.27	2.517	6.16	3.52	3.95
0.533	6.51	1.533	19.27	2.533	6.16	3.53	3.95
0.550	6.51	1.550	19.27	2.550	6.16	3.55	3.95
0.567	6.51	1.567	19.27	2.567	6.16	3.57	3.95
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.048 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 20.923
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.337

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

CALIB	
STANDHYD (0007)	Area (ha)= 1.75
ID= 1 DT= 1.0 min	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	4.06	1.017	27.34	2.017	9.01	3.02	4.78
0.033	4.06	1.033	27.34	2.033	9.00	3.03	4.78
0.050	4.06	1.050	27.34	2.050	9.00	3.05	4.78
0.067	4.06	1.067	27.34	2.067	9.00	3.07	4.78

0.083	4.06	1.083	27.34	2.083	9.00	3.08	4.78
0.100	4.06	1.100	27.34	2.100	9.00	3.10	4.78
0.117	4.06	1.117	27.34	2.117	9.00	3.12	4.78
0.133	4.06	1.133	27.34	2.133	9.00	3.13	4.78
0.150	4.06	1.150	27.34	2.150	9.00	3.15	4.78
0.167	4.06	1.167	27.34	2.167	9.00	3.17	4.78
0.183	4.62	1.183	159.93	2.183	7.77	3.18	4.46
0.200	4.62	1.200	159.94	2.200	7.77	3.20	4.46
0.217	4.62	1.217	159.94	2.217	7.77	3.22	4.46
0.233	4.62	1.233	159.94	2.233	7.77	3.23	4.46
0.250	4.62	1.250	159.94	2.250	7.77	3.25	4.46
0.267	4.62	1.267	159.94	2.267	7.77	3.27	4.46
0.283	4.62	1.283	159.94	2.283	7.77	3.28	4.46
0.300	4.62	1.300	159.94	2.300	7.77	3.30	4.46
0.317	4.62	1.317	159.94	2.317	7.77	3.32	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.350	5.38	1.350	35.46	2.350	6.86	3.35	4.19
0.367	5.38	1.367	35.45	2.367	6.86	3.37	4.19
0.383	5.38	1.383	35.45	2.383	6.86	3.38	4.19
0.400	5.38	1.400	35.45	2.400	6.86	3.40	4.19
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.433	5.38	1.433	35.45	2.433	6.86	3.43	4.19
0.450	5.38	1.450	35.45	2.450	6.86	3.45	4.19
0.467	5.38	1.467	35.45	2.467	6.86	3.47	4.19
0.483	5.38	1.483	35.45	2.483	6.86	3.48	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.517	6.51	1.517	19.27	2.517	6.16	3.52	3.95
0.533	6.51	1.533	19.27	2.533	6.16	3.53	3.95
0.550	6.51	1.550	19.27	2.550	6.16	3.55	3.95
0.567	6.51	1.567	19.27	2.567	6.16	3.57	3.95
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Max.Eff.Inten.(mm/hr)=	159.94	27.21	
over (min)	5.00	8.00	
Storage Coeff. (min)=	2.22 (ii)	7.63 (ii)	
Unit Hyd. Tpeak (min)=	5.00	8.00	
Unit Hyd. peak (cms)=	0.36	0.15	
			TOTALS
PEAK FLOW (cms)=	0.38	0.04	0.410 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	61.15	11.04	36.60
TOTAL RAINFALL (mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT =	0.98	0.18	0.59

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| ADD HYD  (  0018)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0026):     0.27   0.048     1.33    20.92
      + ID2= 2 (  0007):     1.75   0.410     1.33    36.60
        ================================================
        ID = 3 (  0018):     2.02   0.458     1.33    34.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  0009)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                         0.0000     0.0007    |   0.0212      0.0291
                         0.0037     0.0045    |   0.0402      0.0316
                         0.0053     0.0065    |   0.1203      0.0341
                         0.0081     0.0128    |   0.2476      0.0366
                         0.0101     0.0188    |   0.3901      0.0373
                         0.0118     0.0250    |   0.4841      0.0381
                         0.0126     0.0279    |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020      0.458      1.33      34.50
   OUTFLOW: ID= 1 (  0009)      2.020      0.159      1.48      34.03

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 34.62
                  TIME SHIFT OF PEAK FLOW         (min)=  9.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0349

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.95

         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    4.06 | 1.017   27.34 | 2.017    9.01 |  3.02    4.78
               0.033    4.06 | 1.033   27.34 | 2.033    9.00 |  3.03    4.78
               0.050    4.06 | 1.050   27.34 | 2.050    9.00 |  3.05    4.78
               0.067    4.06 | 1.067   27.34 | 2.067    9.00 |  3.07    4.78
               0.083    4.06 | 1.083   27.34 | 2.083    9.00 |  3.08    4.78
               0.100    4.06 | 1.100   27.34 | 2.100    9.00 |  3.10    4.78
               0.117    4.06 | 1.117   27.34 | 2.117    9.00 |  3.12    4.78
               0.133    4.06 | 1.133   27.34 | 2.133    9.00 |  3.13    4.78
               0.150    4.06 | 1.150   27.34 | 2.150    9.00 |  3.15    4.78
               0.167    4.06 | 1.167   27.34 | 2.167    9.00 |  3.17    4.78
               0.183    4.62 | 1.183  159.93 | 2.183    7.77 |  3.18    4.46
               0.200    4.62 | 1.200  159.94 | 2.200    7.77 |  3.20    4.46
               0.217    4.62 | 1.217  159.94 | 2.217    7.77 |  3.22    4.46
               0.233    4.62 | 1.233  159.94 | 2.233    7.77 |  3.23    4.46
               0.250    4.62 | 1.250  159.94 | 2.250    7.77 |  3.25    4.46
               0.267    4.62 | 1.267  159.94 | 2.267    7.77 |  3.27    4.46
               0.283    4.62 | 1.283  159.94 | 2.283    7.77 |  3.28    4.46
               0.300    4.62 | 1.300  159.94 | 2.300    7.77 |  3.30    4.46
               0.317    4.62 | 1.317  159.94 | 2.317    7.77 |  3.32    4.46
               0.333    4.62 | 1.333  159.94 | 2.333    7.77 |  3.33    4.46
               0.350    5.38 | 1.350   35.46 | 2.350    6.86 |  3.35    4.19
               0.367    5.38 | 1.367   35.45 | 2.367    6.86 |  3.37    4.19
               0.383    5.38 | 1.383   35.45 | 2.383    6.86 |  3.38    4.19
               0.400    5.38 | 1.400   35.45 | 2.400    6.86 |  3.40    4.19
               0.417    5.38 | 1.417   35.45 | 2.417    6.86 |  3.42    4.19
               0.433    5.38 | 1.433   35.45 | 2.433    6.86 |  3.43    4.19
               0.450    5.38 | 1.450   35.45 | 2.450    6.86 |  3.45    4.19
               0.467    5.38 | 1.467   35.45 | 2.467    6.86 |  3.47    4.19
               0.483    5.38 | 1.483   35.45 | 2.483    6.86 |  3.48    4.19
               0.500    5.38 | 1.500   35.45 | 2.500    6.86 |  3.50    4.19
               0.517    6.51 | 1.517   19.27 | 2.517    6.16 |  3.52    3.95
               0.533    6.51 | 1.533   19.27 | 2.533    6.16 |  3.53    3.95
               0.550    6.51 | 1.550   19.27 | 2.550    6.16 |  3.55    3.95
               0.567    6.51 | 1.567   19.27 | 2.567    6.16 |  3.57    3.95
```

0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.254 (i)
TIME TO PEAK (hrs)= 2.550
RUNOFF VOLUME (mm)= 14.608
TOTAL RAINFALL (mm)= 62.155
RUNOFF COEFFICIENT = 0.235

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

CALIB	
STANDHYD (0006)	Area (ha)= 0.75
ID= 1 DT= 1.0 min	Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	4.06	1.017	27.34	2.017	9.01	3.02	4.78
0.033	4.06	1.033	27.34	2.033	9.00	3.03	4.78
0.050	4.06	1.050	27.34	2.050	9.00	3.05	4.78
0.067	4.06	1.067	27.34	2.067	9.00	3.07	4.78
0.083	4.06	1.083	27.34	2.083	9.00	3.08	4.78
0.100	4.06	1.100	27.34	2.100	9.00	3.10	4.78
0.117	4.06	1.117	27.34	2.117	9.00	3.12	4.78
0.133	4.06	1.133	27.34	2.133	9.00	3.13	4.78
0.150	4.06	1.150	27.34	2.150	9.00	3.15	4.78
0.167	4.06	1.167	27.34	2.167	9.00	3.17	4.78
0.183	4.62	1.183	159.93	2.183	7.77	3.18	4.46
0.200	4.62	1.200	159.94	2.200	7.77	3.20	4.46
0.217	4.62	1.217	159.94	2.217	7.77	3.22	4.46
0.233	4.62	1.233	159.94	2.233	7.77	3.23	4.46
0.250	4.62	1.250	159.94	2.250	7.77	3.25	4.46
0.267	4.62	1.267	159.94	2.267	7.77	3.27	4.46
0.283	4.62	1.283	159.94	2.283	7.77	3.28	4.46
0.300	4.62	1.300	159.94	2.300	7.77	3.30	4.46
0.317	4.62	1.317	159.94	2.317	7.77	3.32	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.350	5.38	1.350	35.46	2.350	6.86	3.35	4.19
0.367	5.38	1.367	35.45	2.367	6.86	3.37	4.19
0.383	5.38	1.383	35.45	2.383	6.86	3.38	4.19

0.400	5.38	1.400	35.45	2.400	6.86	3.40	4.19
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.433	5.38	1.433	35.45	2.433	6.86	3.43	4.19
0.450	5.38	1.450	35.45	2.450	6.86	3.45	4.19
0.467	5.38	1.467	35.45	2.467	6.86	3.47	4.19
0.483	5.38	1.483	35.45	2.483	6.86	3.48	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.517	6.51	1.517	19.27	2.517	6.16	3.52	3.95
0.533	6.51	1.533	19.27	2.533	6.16	3.53	3.95
0.550	6.51	1.550	19.27	2.550	6.16	3.55	3.95
0.567	6.51	1.567	19.27	2.567	6.16	3.57	3.95
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

			TOTALS
Max.Eff.Inten.(mm/hr)=	159.94	127.60	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.72 (ii)	4.35 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.40	0.25	
PEAK FLOW (cms)=	0.24	0.02	0.266 (iii)
TIME TO PEAK (hrs)=	1.33	1.37	1.33
RUNOFF VOLUME (mm)=	61.15	21.29	50.79
TOTAL RAINFALL (mm)=	62.15	62.15	62.15
RUNOFF COEFFICIENT =	0.98	0.34	0.82

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0011)|	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	0.0912	0.0179
	0.0006	0.0005	0.1027	0.0204
	0.0062	0.0056	0.1264	0.0248
	0.0100	0.0060	0.1349	0.0263
	0.0470	0.0101	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0006)	0.750	0.266	1.33	50.79
OUTFLOW: ID= 1 (0011)	0.750	0.089	1.45	50.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.36
TIME SHIFT OF PEAK FLOW (min)= 7.00
MAXIMUM STORAGE USED (ha.m.)= 0.0174

```
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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	4.06	1.017	27.34	2.017	9.01	3.02	4.78
0.033	4.06	1.033	27.34	2.033	9.00	3.03	4.78
0.050	4.06	1.050	27.34	2.050	9.00	3.05	4.78
0.067	4.06	1.067	27.34	2.067	9.00	3.07	4.78
0.083	4.06	1.083	27.34	2.083	9.00	3.08	4.78
0.100	4.06	1.100	27.34	2.100	9.00	3.10	4.78
0.117	4.06	1.117	27.34	2.117	9.00	3.12	4.78
0.133	4.06	1.133	27.34	2.133	9.00	3.13	4.78
0.150	4.06	1.150	27.34	2.150	9.00	3.15	4.78
0.167	4.06	1.167	27.34	2.167	9.00	3.17	4.78
0.183	4.62	1.183	159.93	2.183	7.77	3.18	4.46
0.200	4.62	1.200	159.94	2.200	7.77	3.20	4.46
0.217	4.62	1.217	159.94	2.217	7.77	3.22	4.46
0.233	4.62	1.233	159.94	2.233	7.77	3.23	4.46
0.250	4.62	1.250	159.94	2.250	7.77	3.25	4.46
0.267	4.62	1.267	159.94	2.267	7.77	3.27	4.46
0.283	4.62	1.283	159.94	2.283	7.77	3.28	4.46
0.300	4.62	1.300	159.94	2.300	7.77	3.30	4.46
0.317	4.62	1.317	159.94	2.317	7.77	3.32	4.46
0.333	4.62	1.333	159.94	2.333	7.77	3.33	4.46
0.350	5.38	1.350	35.46	2.350	6.86	3.35	4.19
0.367	5.38	1.367	35.45	2.367	6.86	3.37	4.19
0.383	5.38	1.383	35.45	2.383	6.86	3.38	4.19
0.400	5.38	1.400	35.45	2.400	6.86	3.40	4.19
0.417	5.38	1.417	35.45	2.417	6.86	3.42	4.19
0.433	5.38	1.433	35.45	2.433	6.86	3.43	4.19
0.450	5.38	1.450	35.45	2.450	6.86	3.45	4.19
0.467	5.38	1.467	35.45	2.467	6.86	3.47	4.19
0.483	5.38	1.483	35.45	2.483	6.86	3.48	4.19
0.500	5.38	1.500	35.45	2.500	6.86	3.50	4.19
0.517	6.51	1.517	19.27	2.517	6.16	3.52	3.95
0.533	6.51	1.533	19.27	2.533	6.16	3.53	3.95
0.550	6.51	1.550	19.27	2.550	6.16	3.55	3.95
0.567	6.51	1.567	19.27	2.567	6.16	3.57	3.95
0.583	6.51	1.583	19.27	2.583	6.16	3.58	3.95
0.600	6.51	1.600	19.27	2.600	6.16	3.60	3.95
0.617	6.51	1.617	19.27	2.617	6.16	3.62	3.95
0.633	6.51	1.633	19.27	2.633	6.16	3.63	3.95
0.650	6.51	1.650	19.27	2.650	6.16	3.65	3.95
0.667	6.51	1.667	19.27	2.667	6.16	3.67	3.95
0.683	8.38	1.683	13.70	2.683	5.61	3.68	3.74
0.700	8.38	1.700	13.70	2.700	5.61	3.70	3.74
0.717	8.38	1.717	13.70	2.717	5.61	3.72	3.74
0.733	8.38	1.733	13.70	2.733	5.61	3.73	3.74
0.750	8.38	1.750	13.70	2.750	5.61	3.75	3.74
0.767	8.38	1.767	13.70	2.767	5.61	3.77	3.74
0.783	8.38	1.783	13.70	2.783	5.61	3.78	3.74
0.800	8.38	1.800	13.70	2.800	5.61	3.80	3.74
0.817	8.38	1.817	13.70	2.817	5.61	3.82	3.74
0.833	8.38	1.833	13.70	2.833	5.61	3.83	3.74
0.850	12.24	1.850	10.80	2.850	5.16	3.85	3.55
0.867	12.24	1.867	10.80	2.867	5.16	3.87	3.55
0.883	12.24	1.883	10.80	2.883	5.16	3.88	3.55
0.900	12.24	1.900	10.80	2.900	5.16	3.90	3.55
0.917	12.24	1.917	10.80	2.917	5.16	3.92	3.55
0.933	12.24	1.933	10.80	2.933	5.16	3.93	3.55
0.950	12.24	1.950	10.80	2.950	5.16	3.95	3.55
0.967	12.24	1.967	10.80	2.967	5.16	3.97	3.55
0.983	12.24	1.983	10.80	2.983	5.16	3.98	3.55
1.000	12.24	2.000	10.80	3.000	5.16	4.00	3.55

```
     Max.Eff.Inten.(mm/hr)=     159.94        36.16
                over (min)        5.00         9.00
     Storage Coeff.  (min)=       2.38 (ii)    8.01 (ii)
     Unit Hyd. Tpeak (min)=       5.00         9.00
     Unit Hyd. peak  (cms)=       0.35         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.42         0.06          0.460 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.43           1.33
     RUNOFF VOLUME    (mm)=      61.15        12.55          34.42
     TOTAL RAINFALL   (mm)=      62.15        62.15          62.15
     RUNOFF COEFFICIENT   =       0.98         0.20           0.55


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0010)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0570      0.0442
                          0.0008     0.0012   |   0.0640      0.0503
                          0.0063     0.0138   |   0.0780      0.0611
                          0.0090     0.0149   |   0.0830      0.0649
                          0.0320     0.0249   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (  0008)     2.200      0.460      1.33      34.42
    OUTFLOW: ID= 1 (  0010)     2.200      0.058      1.85      34.25

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 12.54
                   TIME SHIFT OF PEAK FLOW         (min)= 31.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0448

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0039)|   Area    (ha)=   0.08
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.04
     Dep. Storage     (mm)=       1.00         2.30
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      23.09        40.00
     Mannings n             =    0.013        0.250

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


                            ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    4.06 | 1.083   27.34 | 2.083    9.00 |  3.08    4.78
                0.167    4.06 | 1.167   27.34 | 2.167    9.00 |  3.17    4.78
                0.250    4.62 | 1.250  159.94 | 2.250    7.77 |  3.25    4.46
                0.333    4.62 | 1.333  159.94 | 2.333    7.77 |  3.33    4.46
                0.417    5.38 | 1.417   35.45 | 2.417    6.86 |  3.42    4.19
                0.500    5.38 | 1.500   35.45 | 2.500    6.86 |  3.50    4.19
                0.583    6.51 | 1.583   19.27 | 2.583    6.16 |  3.58    3.95
                0.667    6.51 | 1.667   19.27 | 2.667    6.16 |  3.67    3.95
                0.750    8.38 | 1.750   13.70 | 2.750    5.61 |  3.75    3.74
                0.833    8.38 | 1.833   13.70 | 2.833    5.61 |  3.83    3.74
                0.917   12.24 | 1.917   10.80 | 2.917    5.16 |  3.92    3.55
                1.000   12.24 | 2.000   10.80 | 3.000    5.16 |  4.00    3.55

     Max.Eff.Inten.(mm/hr)=     159.94       177.95
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.88 (ii)    6.48 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.025 (iii)
```

```
     TIME TO PEAK    (hrs)=       1.33         1.42          1.33
     RUNOFF VOLUME    (mm)=      61.15        50.05         53.88
     TOTAL RAINFALL   (mm)=      62.15        62.15         62.15
     RUNOFF COEFFICIENT   =       0.98         0.81          0.87

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  94.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.20   0.058     1.85    34.25
     + ID2= 2 (  0011):     0.75   0.089     1.45    50.51
       ================================================
       ID = 3 (  0004):     2.95   0.139     1.53    38.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):     2.95   0.139     1.53    38.38
     + ID2= 2 (  0027):    16.11   0.254     2.55    14.61
       ================================================
       ID = 1 (  0004):    19.06   0.330     2.40    18.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    19.06   0.330     2.40    18.29
     + ID2= 2 (  0003):     4.63   0.018     4.08    22.30
       ================================================
       ID = 3 (  0004):    23.69   0.346     2.40    19.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):    23.69   0.346     2.40    19.07
     + ID2= 2 (  0039):     0.08   0.025     1.33    53.88
       ================================================
       ID = 1 (  0004):    23.77   0.347     2.40    19.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    23.77   0.347     2.40    19.19
     + ID2= 2 (  0009):     2.02   0.159     1.48    34.03
       ================================================
       ID = 3 (  0004):    25.79   0.383     2.33    20.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  **********************************************
  ** SIMULATION : Run 05                       **
  **********************************************

--------------------
```

| CHICAGO STORM | IDF curve parameters: A=1448.000
| Ptotal= 70.32 mm | B= 3.000
C= 0.803
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	4.16	1.17	32.64	2.17	9.72	3.17	4.94
0.33	4.76	1.33	184.62	2.33	8.29	3.33	4.59
0.50	5.60	1.50	43.10	2.50	7.26	3.50	4.29
0.67	6.86	1.67	22.23	2.67	6.47	3.67	4.03
0.83	9.00	1.83	15.32	2.83	5.85	3.83	3.81
1.00	13.56	2.00	11.84	3.00	5.35	4.00	3.61

| CALIB | NASHYD (0025) | ID= 1 DT= 1.0 min | Area (ha)= 1.43 Curve Number (CN)= 67.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.34

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	4.16	1.017	32.64	2.017	9.72	3.02	4.94
0.033	4.16	1.033	32.64	2.033	9.72	3.03	4.94
0.050	4.16	1.050	32.64	2.050	9.72	3.05	4.94
0.067	4.16	1.067	32.64	2.067	9.72	3.07	4.94
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.100	4.16	1.100	32.64	2.100	9.72	3.10	4.94
0.117	4.16	1.117	32.64	2.117	9.72	3.12	4.94
0.133	4.16	1.133	32.64	2.133	9.72	3.13	4.94
0.150	4.16	1.150	32.64	2.150	9.72	3.15	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.183	4.76	1.183	184.61	2.183	8.29	3.18	4.59
0.200	4.76	1.200	184.62	2.200	8.29	3.20	4.59
0.217	4.76	1.217	184.62	2.217	8.29	3.22	4.59
0.233	4.76	1.233	184.62	2.233	8.29	3.23	4.59
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.267	4.76	1.267	184.62	2.267	8.29	3.27	4.59
0.283	4.76	1.283	184.62	2.283	8.29	3.28	4.59
0.300	4.76	1.300	184.62	2.300	8.29	3.30	4.59
0.317	4.76	1.317	184.62	2.317	8.29	3.32	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.350	5.60	1.350	43.10	2.350	7.26	3.35	4.29
0.367	5.60	1.367	43.10	2.367	7.26	3.37	4.29
0.383	5.60	1.383	43.10	2.383	7.26	3.38	4.29
0.400	5.60	1.400	43.10	2.400	7.26	3.40	4.29
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29
0.433	5.60	1.433	43.10	2.433	7.26	3.43	4.29
0.450	5.60	1.450	43.10	2.450	7.26	3.45	4.29
0.467	5.60	1.467	43.10	2.467	7.26	3.47	4.29
0.483	5.60	1.483	43.10	2.483	7.26	3.48	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.517	6.86	1.517	22.23	2.517	6.47	3.52	4.03
0.533	6.86	1.533	22.23	2.533	6.47	3.53	4.03
0.550	6.86	1.550	22.23	2.550	6.47	3.55	4.03
0.567	6.86	1.567	22.23	2.567	6.47	3.57	4.03
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.600	6.86	1.600	22.23	2.600	6.47	3.60	4.03
0.617	6.86	1.617	22.23	2.617	6.47	3.62	4.03
0.633	6.86	1.633	22.23	2.633	6.47	3.63	4.03
0.650	6.86	1.650	22.23	2.650	6.47	3.65	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.683	9.00	1.683	15.32	2.683	5.85	3.68	3.81
0.700	9.00	1.700	15.32	2.700	5.85	3.70	3.81
0.717	9.00	1.717	15.32	2.717	5.85	3.72	3.81
0.733	9.00	1.733	15.32	2.733	5.85	3.73	3.81
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.767	9.00	1.767	15.32	2.767	5.85	3.77	3.81
0.783	9.00	1.783	15.32	2.783	5.85	3.78	3.81

0.800	9.00	1.800	15.32	2.800	5.85	3.80	3.81
0.817	9.00	1.817	15.32	2.817	5.85	3.82	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.850	13.56	1.850	11.84	2.850	5.35	3.85	3.61
0.867	13.56	1.867	11.84	2.867	5.35	3.87	3.61
0.883	13.56	1.883	11.84	2.883	5.35	3.88	3.61
0.900	13.56	1.900	11.84	2.900	5.35	3.90	3.61
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.076 (i)
TIME TO PEAK (hrs)= 1.700
RUNOFF VOLUME (mm)= 22.404
TOTAL RAINFALL (mm)= 70.316
RUNOFF COEFFICIENT = 0.319

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

CALIB
STANDHYD (0001)
ID= 1 DT= 1.0 min

Area (ha)= 2.91
Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.63	1.28
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.50	3.00
Length (m)=	139.28	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	4.16	1.017	32.64	2.017	9.72	3.02	4.94
0.033	4.16	1.033	32.64	2.033	9.72	3.03	4.94
0.050	4.16	1.050	32.64	2.050	9.72	3.05	4.94
0.067	4.16	1.067	32.64	2.067	9.72	3.07	4.94
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.100	4.16	1.100	32.64	2.100	9.72	3.10	4.94
0.117	4.16	1.117	32.64	2.117	9.72	3.12	4.94
0.133	4.16	1.133	32.64	2.133	9.72	3.13	4.94
0.150	4.16	1.150	32.64	2.150	9.72	3.15	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.183	4.76	1.183	184.61	2.183	8.29	3.18	4.59
0.200	4.76	1.200	184.62	2.200	8.29	3.20	4.59
0.217	4.76	1.217	184.62	2.217	8.29	3.22	4.59
0.233	4.76	1.233	184.62	2.233	8.29	3.23	4.59
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.267	4.76	1.267	184.62	2.267	8.29	3.27	4.59
0.283	4.76	1.283	184.62	2.283	8.29	3.28	4.59
0.300	4.76	1.300	184.62	2.300	8.29	3.30	4.59
0.317	4.76	1.317	184.62	2.317	8.29	3.32	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.350	5.60	1.350	43.10	2.350	7.26	3.35	4.29
0.367	5.60	1.367	43.10	2.367	7.26	3.37	4.29
0.383	5.60	1.383	43.10	2.383	7.26	3.38	4.29
0.400	5.60	1.400	43.10	2.400	7.26	3.40	4.29
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29
0.433	5.60	1.433	43.10	2.433	7.26	3.43	4.29
0.450	5.60	1.450	43.10	2.450	7.26	3.45	4.29
0.467	5.60	1.467	43.10	2.467	7.26	3.47	4.29
0.483	5.60	1.483	43.10	2.483	7.26	3.48	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.517	6.86	1.517	22.23	2.517	6.47	3.52	4.03
0.533	6.86	1.533	22.23	2.533	6.47	3.53	4.03
0.550	6.86	1.550	22.23	2.550	6.47	3.55	4.03
0.567	6.86	1.567	22.23	2.567	6.47	3.57	4.03
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.600	6.86	1.600	22.23	2.600	6.47	3.60	4.03

0.617	6.86	1.617	22.23	2.617	6.47	3.62	4.03
0.633	6.86	1.633	22.23	2.633	6.47	3.63	4.03
0.650	6.86	1.650	22.23	2.650	6.47	3.65	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.683	9.00	1.683	15.32	2.683	5.85	3.68	3.81
0.700	9.00	1.700	15.32	2.700	5.85	3.70	3.81
0.717	9.00	1.717	15.32	2.717	5.85	3.72	3.81
0.733	9.00	1.733	15.32	2.733	5.85	3.73	3.81
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.767	9.00	1.767	15.32	2.767	5.85	3.77	3.81
0.783	9.00	1.783	15.32	2.783	5.85	3.78	3.81
0.800	9.00	1.800	15.32	2.800	5.85	3.80	3.81
0.817	9.00	1.817	15.32	2.817	5.85	3.82	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.850	13.56	1.850	11.84	2.850	5.35	3.85	3.61
0.867	13.56	1.867	11.84	2.867	5.35	3.87	3.61
0.883	13.56	1.883	11.84	2.883	5.35	3.88	3.61
0.900	13.56	1.900	11.84	2.900	5.35	3.90	3.61
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Max.Eff.Inten.(mm/hr)=	184.62	32.66		
over (min)	5.00	7.00		
Storage Coeff. (min)=	2.16 (ii)	6.77 (ii)		
Unit Hyd. Tpeak (min)=	5.00	7.00		
Unit Hyd. peak (cms)=	0.36	0.17		
			TOTALS	
PEAK FLOW (cms)=	0.74	0.09	0.804 (iii)	
TIME TO PEAK (hrs)=	1.33	1.40	1.33	
RUNOFF VOLUME (mm)=	69.32	13.41	41.92	
TOTAL RAINFALL (mm)=	70.32	70.32	70.32	
RUNOFF COEFFICIENT =	0.99	0.19	0.60	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0028)	Area (ha)= 0.29
ID= 1 DT= 1.0 min	Total Imp(%)= 67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	4.16	1.017	32.64	2.017	9.72	3.02	4.94
0.033	4.16	1.033	32.64	2.033	9.72	3.03	4.94
0.050	4.16	1.050	32.64	2.050	9.72	3.05	4.94
0.067	4.16	1.067	32.64	2.067	9.72	3.07	4.94
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.100	4.16	1.100	32.64	2.100	9.72	3.10	4.94
0.117	4.16	1.117	32.64	2.117	9.72	3.12	4.94
0.133	4.16	1.133	32.64	2.133	9.72	3.13	4.94
0.150	4.16	1.150	32.64	2.150	9.72	3.15	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.183	4.76	1.183	184.61	2.183	8.29	3.18	4.59
0.200	4.76	1.200	184.62	2.200	8.29	3.20	4.59
0.217	4.76	1.217	184.62	2.217	8.29	3.22	4.59
0.233	4.76	1.233	184.62	2.233	8.29	3.23	4.59
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.267	4.76	1.267	184.62	2.267	8.29	3.27	4.59

0.283	4.76	1.283	184.62	2.283	8.29	3.28	4.59
0.300	4.76	1.300	184.62	2.300	8.29	3.30	4.59
0.317	4.76	1.317	184.62	2.317	8.29	3.32	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.350	5.60	1.350	43.10	2.350	7.26	3.35	4.29
0.367	5.60	1.367	43.10	2.367	7.26	3.37	4.29
0.383	5.60	1.383	43.10	2.383	7.26	3.38	4.29
0.400	5.60	1.400	43.10	2.400	7.26	3.40	4.29
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29
0.433	5.60	1.433	43.10	2.433	7.26	3.43	4.29
0.450	5.60	1.450	43.10	2.450	7.26	3.45	4.29
0.467	5.60	1.467	43.10	2.467	7.26	3.47	4.29
0.483	5.60	1.483	43.10	2.483	7.26	3.48	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.517	6.86	1.517	22.23	2.517	6.47	3.52	4.03
0.533	6.86	1.533	22.23	2.533	6.47	3.53	4.03
0.550	6.86	1.550	22.23	2.550	6.47	3.55	4.03
0.567	6.86	1.567	22.23	2.567	6.47	3.57	4.03
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.600	6.86	1.600	22.23	2.600	6.47	3.60	4.03
0.617	6.86	1.617	22.23	2.617	6.47	3.62	4.03
0.633	6.86	1.633	22.23	2.633	6.47	3.63	4.03
0.650	6.86	1.650	22.23	2.650	6.47	3.65	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.683	9.00	1.683	15.32	2.683	5.85	3.68	3.81
0.700	9.00	1.700	15.32	2.700	5.85	3.70	3.81
0.717	9.00	1.717	15.32	2.717	5.85	3.72	3.81
0.733	9.00	1.733	15.32	2.733	5.85	3.73	3.81
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.767	9.00	1.767	15.32	2.767	5.85	3.77	3.81
0.783	9.00	1.783	15.32	2.783	5.85	3.78	3.81
0.800	9.00	1.800	15.32	2.800	5.85	3.80	3.81
0.817	9.00	1.817	15.32	2.817	5.85	3.82	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.850	13.56	1.850	11.84	2.850	5.35	3.85	3.61
0.867	13.56	1.867	11.84	2.867	5.35	3.87	3.61
0.883	13.56	1.883	11.84	2.883	5.35	3.88	3.61
0.900	13.56	1.900	11.84	2.900	5.35	3.90	3.61
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Max.Eff.Inten.(mm/hr)=	184.62	26.18	
over (min)	5.00	6.00	
Storage Coeff. (min)=	1.22 (ii)	5.38 (ii)	
Unit Hyd. Tpeak (min)=	5.00	6.00	
Unit Hyd. peak (cms)=	0.45	0.20	
			TOTALS
PEAK FLOW (cms)=	0.10	0.01	0.104 (iii)
TIME TO PEAK (hrs)=	1.33	1.38	1.33
RUNOFF VOLUME (mm)=	69.32	12.13	50.43
TOTAL RAINFALL (mm)=	70.32	70.32	70.32
RUNOFF COEFFICIENT =	0.99	0.17	0.72

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0016) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	2.91	0.804	1.33	41.92
+ ID2= 2 (0025):	1.43	0.076	1.70	22.40
ID = 3 (0016):	4.34	0.821	1.33	35.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD  (  0016)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.821     1.33    35.49
      + ID2= 2 (  0028):     0.29   0.104     1.33    50.43
        ================================================
        ID = 1 (  0016):     4.63   0.925     1.33    36.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0130      0.0895
                         0.0000     0.0291   |   0.0210      0.1555
                         0.0010     0.0332   |   0.0230      0.1780
                         0.0040     0.0496   |   0.0280      0.2176
                         0.0050     0.0537   |   0.0300      0.2309

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0016)     4.630      0.925      1.33      36.43
   OUTFLOW: ID= 1 (  0003)     4.630      0.020      4.08      26.91

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.19
                  TIME SHIFT OF PEAK FLOW         (min)=165.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1494

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0026)|   Area    (ha)=   0.27   Curve Number   (CN)= 71.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   3.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.02

        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    4.16 | 1.017   32.64 | 2.017    9.72 |  3.02    4.94
               0.033    4.16 | 1.033   32.64 | 2.033    9.72 |  3.03    4.94
               0.050    4.16 | 1.050   32.64 | 2.050    9.72 |  3.05    4.94
               0.067    4.16 | 1.067   32.64 | 2.067    9.72 |  3.07    4.94
               0.083    4.16 | 1.083   32.64 | 2.083    9.72 |  3.08    4.94
               0.100    4.16 | 1.100   32.64 | 2.100    9.72 |  3.10    4.94
               0.117    4.16 | 1.117   32.64 | 2.117    9.72 |  3.12    4.94
               0.133    4.16 | 1.133   32.64 | 2.133    9.72 |  3.13    4.94
               0.150    4.16 | 1.150   32.64 | 2.150    9.72 |  3.15    4.94
               0.167    4.16 | 1.167   32.64 | 2.167    9.72 |  3.17    4.94
               0.183    4.76 | 1.183  184.61 | 2.183    8.29 |  3.18    4.59
               0.200    4.76 | 1.200  184.62 | 2.200    8.29 |  3.20    4.59
               0.217    4.76 | 1.217  184.62 | 2.217    8.29 |  3.22    4.59
               0.233    4.76 | 1.233  184.62 | 2.233    8.29 |  3.23    4.59
               0.250    4.76 | 1.250  184.62 | 2.250    8.29 |  3.25    4.59
               0.267    4.76 | 1.267  184.62 | 2.267    8.29 |  3.27    4.59
               0.283    4.76 | 1.283  184.62 | 2.283    8.29 |  3.28    4.59
               0.300    4.76 | 1.300  184.62 | 2.300    8.29 |  3.30    4.59
               0.317    4.76 | 1.317  184.62 | 2.317    8.29 |  3.32    4.59
               0.333    4.76 | 1.333  184.62 | 2.333    8.29 |  3.33    4.59
               0.350    5.60 | 1.350   43.10 | 2.350    7.26 |  3.35    4.29
               0.367    5.60 | 1.367   43.10 | 2.367    7.26 |  3.37    4.29
               0.383    5.60 | 1.383   43.10 | 2.383    7.26 |  3.38    4.29
               0.400    5.60 | 1.400   43.10 | 2.400    7.26 |  3.40    4.29
               0.417    5.60 | 1.417   43.10 | 2.417    7.26 |  3.42    4.29
               0.433    5.60 | 1.433   43.10 | 2.433    7.26 |  3.43    4.29
               0.450    5.60 | 1.450   43.10 | 2.450    7.26 |  3.45    4.29
               0.467    5.60 | 1.467   43.10 | 2.467    7.26 |  3.47    4.29
               0.483    5.60 | 1.483   43.10 | 2.483    7.26 |  3.48    4.29
               0.500    5.60 | 1.500   43.10 | 2.500    7.26 |  3.50    4.29
               0.517    6.86 | 1.517   22.23 | 2.517    6.47 |  3.52    4.03
               0.533    6.86 | 1.533   22.23 | 2.533    6.47 |  3.53    4.03
               0.550    6.86 | 1.550   22.23 | 2.550    6.47 |  3.55    4.03
               0.567    6.86 | 1.567   22.23 | 2.567    6.47 |  3.57    4.03
               0.583    6.86 | 1.583   22.23 | 2.583    6.47 |  3.58    4.03
               0.600    6.86 | 1.600   22.23 | 2.600    6.47 |  3.60    4.03
```

0.617	6.86	1.617	22.23	2.617	6.47	3.62	4.03
0.633	6.86	1.633	22.23	2.633	6.47	3.63	4.03
0.650	6.86	1.650	22.23	2.650	6.47	3.65	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.683	9.00	1.683	15.32	2.683	5.85	3.68	3.81
0.700	9.00	1.700	15.32	2.700	5.85	3.70	3.81
0.717	9.00	1.717	15.32	2.717	5.85	3.72	3.81
0.733	9.00	1.733	15.32	2.733	5.85	3.73	3.81
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.767	9.00	1.767	15.32	2.767	5.85	3.77	3.81
0.783	9.00	1.783	15.32	2.783	5.85	3.78	3.81
0.800	9.00	1.800	15.32	2.800	5.85	3.80	3.81
0.817	9.00	1.817	15.32	2.817	5.85	3.82	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.850	13.56	1.850	11.84	2.850	5.35	3.85	3.61
0.867	13.56	1.867	11.84	2.867	5.35	3.87	3.61
0.883	13.56	1.883	11.84	2.883	5.35	3.88	3.61
0.900	13.56	1.900	11.84	2.900	5.35	3.90	3.61
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.061 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 25.802
TOTAL RAINFALL (mm)= 70.316
RUNOFF COEFFICIENT = 0.367

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

CALIB	
STANDHYD (0007)	Area (ha)= 1.75
ID= 1 DT= 1.0 min	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	4.16	1.017	32.64	2.017	9.72	3.02	4.94
0.033	4.16	1.033	32.64	2.033	9.72	3.03	4.94
0.050	4.16	1.050	32.64	2.050	9.72	3.05	4.94
0.067	4.16	1.067	32.64	2.067	9.72	3.07	4.94
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.100	4.16	1.100	32.64	2.100	9.72	3.10	4.94
0.117	4.16	1.117	32.64	2.117	9.72	3.12	4.94
0.133	4.16	1.133	32.64	2.133	9.72	3.13	4.94
0.150	4.16	1.150	32.64	2.150	9.72	3.15	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.183	4.76	1.183	184.61	2.183	8.29	3.18	4.59
0.200	4.76	1.200	184.62	2.200	8.29	3.20	4.59
0.217	4.76	1.217	184.62	2.217	8.29	3.22	4.59
0.233	4.76	1.233	184.62	2.233	8.29	3.23	4.59
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.267	4.76	1.267	184.62	2.267	8.29	3.27	4.59
0.283	4.76	1.283	184.62	2.283	8.29	3.28	4.59
0.300	4.76	1.300	184.62	2.300	8.29	3.30	4.59
0.317	4.76	1.317	184.62	2.317	8.29	3.32	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.350	5.60	1.350	43.10	2.350	7.26	3.35	4.29
0.367	5.60	1.367	43.10	2.367	7.26	3.37	4.29
0.383	5.60	1.383	43.10	2.383	7.26	3.38	4.29
0.400	5.60	1.400	43.10	2.400	7.26	3.40	4.29
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29

0.433	5.60	1.433	43.10	2.433	7.26	3.43	4.29
0.450	5.60	1.450	43.10	2.450	7.26	3.45	4.29
0.467	5.60	1.467	43.10	2.467	7.26	3.47	4.29
0.483	5.60	1.483	43.10	2.483	7.26	3.48	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.517	6.86	1.517	22.23	2.517	6.47	3.52	4.03
0.533	6.86	1.533	22.23	2.533	6.47	3.53	4.03
0.550	6.86	1.550	22.23	2.550	6.47	3.55	4.03
0.567	6.86	1.567	22.23	2.567	6.47	3.57	4.03
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.600	6.86	1.600	22.23	2.600	6.47	3.60	4.03
0.617	6.86	1.617	22.23	2.617	6.47	3.62	4.03
0.633	6.86	1.633	22.23	2.633	6.47	3.63	4.03
0.650	6.86	1.650	22.23	2.650	6.47	3.65	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.683	9.00	1.683	15.32	2.683	5.85	3.68	3.81
0.700	9.00	1.700	15.32	2.700	5.85	3.70	3.81
0.717	9.00	1.717	15.32	2.717	5.85	3.72	3.81
0.733	9.00	1.733	15.32	2.733	5.85	3.73	3.81
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.767	9.00	1.767	15.32	2.767	5.85	3.77	3.81
0.783	9.00	1.783	15.32	2.783	5.85	3.78	3.81
0.800	9.00	1.800	15.32	2.800	5.85	3.80	3.81
0.817	9.00	1.817	15.32	2.817	5.85	3.82	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.850	13.56	1.850	11.84	2.850	5.35	3.85	3.61
0.867	13.56	1.867	11.84	2.867	5.35	3.87	3.61
0.883	13.56	1.883	11.84	2.883	5.35	3.88	3.61
0.900	13.56	1.900	11.84	2.900	5.35	3.90	3.61
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Max.Eff.Inten.(mm/hr)=	184.62	35.88	
over (min)	5.00	8.00	
Storage Coeff. (min)=	2.09 (ii)	7.20 (ii)	
Unit Hyd. Tpeak (min)=	5.00	8.00	
Unit Hyd. peak (cms)=	0.37	0.15	
			TOTALS
PEAK FLOW (cms)=	0.45	0.05	0.482 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	69.32	13.99	42.21
TOTAL RAINFALL (mm)=	70.32	70.32	70.32
RUNOFF COEFFICIENT =	0.99	0.20	0.60

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0018)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0026):		0.27	0.061	1.33	25.80
+ ID2= 2 (0007):		1.75	0.482	1.33	42.21
ID = 3 (0018):		2.02	0.542	1.33	40.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0009)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0007	0.0212	0.0291
	0.0037	0.0045	0.0402	0.0316
	0.0053	0.0065	0.1203	0.0341
	0.0081	0.0128	0.2476	0.0366
	0.0101	0.0188	0.3901	0.0373
	0.0118	0.0250	0.4841	0.0381

```
                        0.0126     0.0279   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020     0.542      1.33      40.01
   OUTFLOW: ID= 1 (  0009)      2.020     0.301      1.42      39.54

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 55.58
                    TIME SHIFT OF PEAK FLOW         (min)=  5.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0369

--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.95

         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    4.16 | 1.017   32.64 | 2.017    9.72 |  3.02    4.94
               0.033    4.16 | 1.033   32.64 | 2.033    9.72 |  3.03    4.94
               0.050    4.16 | 1.050   32.64 | 2.050    9.72 |  3.05    4.94
               0.067    4.16 | 1.067   32.64 | 2.067    9.72 |  3.07    4.94
               0.083    4.16 | 1.083   32.64 | 2.083    9.72 |  3.08    4.94
               0.100    4.16 | 1.100   32.64 | 2.100    9.72 |  3.10    4.94
               0.117    4.16 | 1.117   32.64 | 2.117    9.72 |  3.12    4.94
               0.133    4.16 | 1.133   32.64 | 2.133    9.72 |  3.13    4.94
               0.150    4.16 | 1.150   32.64 | 2.150    9.72 |  3.15    4.94
               0.167    4.16 | 1.167   32.64 | 2.167    9.72 |  3.17    4.94
               0.183    4.76 | 1.183  184.61 | 2.183    8.29 |  3.18    4.59
               0.200    4.76 | 1.200  184.62 | 2.200    8.29 |  3.20    4.59
               0.217    4.76 | 1.217  184.62 | 2.217    8.29 |  3.22    4.59
               0.233    4.76 | 1.233  184.62 | 2.233    8.29 |  3.23    4.59
               0.250    4.76 | 1.250  184.62 | 2.250    8.29 |  3.25    4.59
               0.267    4.76 | 1.267  184.62 | 2.267    8.29 |  3.27    4.59
               0.283    4.76 | 1.283  184.62 | 2.283    8.29 |  3.28    4.59
               0.300    4.76 | 1.300  184.62 | 2.300    8.29 |  3.30    4.59
               0.317    4.76 | 1.317  184.62 | 2.317    8.29 |  3.32    4.59
               0.333    4.76 | 1.333  184.62 | 2.333    8.29 |  3.33    4.59
               0.350    5.60 | 1.350   43.10 | 2.350    7.26 |  3.35    4.29
               0.367    5.60 | 1.367   43.10 | 2.367    7.26 |  3.37    4.29
               0.383    5.60 | 1.383   43.10 | 2.383    7.26 |  3.38    4.29
               0.400    5.60 | 1.400   43.10 | 2.400    7.26 |  3.40    4.29
               0.417    5.60 | 1.417   43.10 | 2.417    7.26 |  3.42    4.29
               0.433    5.60 | 1.433   43.10 | 2.433    7.26 |  3.43    4.29
               0.450    5.60 | 1.450   43.10 | 2.450    7.26 |  3.45    4.29
               0.467    5.60 | 1.467   43.10 | 2.467    7.26 |  3.47    4.29
               0.483    5.60 | 1.483   43.10 | 2.483    7.26 |  3.48    4.29
               0.500    5.60 | 1.500   43.10 | 2.500    7.26 |  3.50    4.29
               0.517    6.86 | 1.517   22.23 | 2.517    6.47 |  3.52    4.03
               0.533    6.86 | 1.533   22.23 | 2.533    6.47 |  3.53    4.03
               0.550    6.86 | 1.550   22.23 | 2.550    6.47 |  3.55    4.03
               0.567    6.86 | 1.567   22.23 | 2.567    6.47 |  3.57    4.03
               0.583    6.86 | 1.583   22.23 | 2.583    6.47 |  3.58    4.03
               0.600    6.86 | 1.600   22.23 | 2.600    6.47 |  3.60    4.03
               0.617    6.86 | 1.617   22.23 | 2.617    6.47 |  3.62    4.03
               0.633    6.86 | 1.633   22.23 | 2.633    6.47 |  3.63    4.03
               0.650    6.86 | 1.650   22.23 | 2.650    6.47 |  3.65    4.03
               0.667    6.86 | 1.667   22.23 | 2.667    6.47 |  3.67    4.03
               0.683    9.00 | 1.683   15.32 | 2.683    5.85 |  3.68    3.81
               0.700    9.00 | 1.700   15.32 | 2.700    5.85 |  3.70    3.81
               0.717    9.00 | 1.717   15.32 | 2.717    5.85 |  3.72    3.81
               0.733    9.00 | 1.733   15.32 | 2.733    5.85 |  3.73    3.81
               0.750    9.00 | 1.750   15.32 | 2.750    5.85 |  3.75    3.81
               0.767    9.00 | 1.767   15.32 | 2.767    5.85 |  3.77    3.81
               0.783    9.00 | 1.783   15.32 | 2.783    5.85 |  3.78    3.81
               0.800    9.00 | 1.800   15.32 | 2.800    5.85 |  3.80    3.81
               0.817    9.00 | 1.817   15.32 | 2.817    5.85 |  3.82    3.81
               0.833    9.00 | 1.833   15.32 | 2.833    5.85 |  3.83    3.81
               0.850   13.56 | 1.850   11.84 | 2.850    5.35 |  3.85    3.61
               0.867   13.56 | 1.867   11.84 | 2.867    5.35 |  3.87    3.61
               0.883   13.56 | 1.883   11.84 | 2.883    5.35 |  3.88    3.61
               0.900   13.56 | 1.900   11.84 | 2.900    5.35 |  3.90    3.61
               0.917   13.56 | 1.917   11.84 | 2.917    5.35 |  3.92    3.61
```

0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.332 (i)
TIME TO PEAK (hrs)= 2.517
RUNOFF VOLUME (mm)= 18.441
TOTAL RAINFALL (mm)= 70.316
RUNOFF COEFFICIENT = 0.262

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

CALIB
STANDHYD (0006)
ID= 1 DT= 1.0 min

Area (ha)= 0.75
Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	4.16	1.017	32.64	2.017	9.72	3.02	4.94
0.033	4.16	1.033	32.64	2.033	9.72	3.03	4.94
0.050	4.16	1.050	32.64	2.050	9.72	3.05	4.94
0.067	4.16	1.067	32.64	2.067	9.72	3.07	4.94
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.100	4.16	1.100	32.64	2.100	9.72	3.10	4.94
0.117	4.16	1.117	32.64	2.117	9.72	3.12	4.94
0.133	4.16	1.133	32.64	2.133	9.72	3.13	4.94
0.150	4.16	1.150	32.64	2.150	9.72	3.15	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.183	4.76	1.183	184.61	2.183	8.29	3.18	4.59
0.200	4.76	1.200	184.62	2.200	8.29	3.20	4.59
0.217	4.76	1.217	184.62	2.217	8.29	3.22	4.59
0.233	4.76	1.233	184.62	2.233	8.29	3.23	4.59
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.267	4.76	1.267	184.62	2.267	8.29	3.27	4.59
0.283	4.76	1.283	184.62	2.283	8.29	3.28	4.59
0.300	4.76	1.300	184.62	2.300	8.29	3.30	4.59
0.317	4.76	1.317	184.62	2.317	8.29	3.32	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.350	5.60	1.350	43.10	2.350	7.26	3.35	4.29
0.367	5.60	1.367	43.10	2.367	7.26	3.37	4.29
0.383	5.60	1.383	43.10	2.383	7.26	3.38	4.29
0.400	5.60	1.400	43.10	2.400	7.26	3.40	4.29
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29
0.433	5.60	1.433	43.10	2.433	7.26	3.43	4.29
0.450	5.60	1.450	43.10	2.450	7.26	3.45	4.29
0.467	5.60	1.467	43.10	2.467	7.26	3.47	4.29
0.483	5.60	1.483	43.10	2.483	7.26	3.48	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.517	6.86	1.517	22.23	2.517	6.47	3.52	4.03
0.533	6.86	1.533	22.23	2.533	6.47	3.53	4.03
0.550	6.86	1.550	22.23	2.550	6.47	3.55	4.03
0.567	6.86	1.567	22.23	2.567	6.47	3.57	4.03
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.600	6.86	1.600	22.23	2.600	6.47	3.60	4.03
0.617	6.86	1.617	22.23	2.617	6.47	3.62	4.03
0.633	6.86	1.633	22.23	2.633	6.47	3.63	4.03
0.650	6.86	1.650	22.23	2.650	6.47	3.65	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.683	9.00	1.683	15.32	2.683	5.85	3.68	3.81
0.700	9.00	1.700	15.32	2.700	5.85	3.70	3.81
0.717	9.00	1.717	15.32	2.717	5.85	3.72	3.81
0.733	9.00	1.733	15.32	2.733	5.85	3.73	3.81

0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.767	9.00	1.767	15.32	2.767	5.85	3.77	3.81
0.783	9.00	1.783	15.32	2.783	5.85	3.78	3.81
0.800	9.00	1.800	15.32	2.800	5.85	3.80	3.81
0.817	9.00	1.817	15.32	2.817	5.85	3.82	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.850	13.56	1.850	11.84	2.850	5.35	3.85	3.61
0.867	13.56	1.867	11.84	2.867	5.35	3.87	3.61
0.883	13.56	1.883	11.84	2.883	5.35	3.88	3.61
0.900	13.56	1.900	11.84	2.900	5.35	3.90	3.61
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Max.Eff.Inten.(mm/hr)=	184.62	162.80	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.62 (ii)	4.10 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.41	0.26	
			TOTALS
PEAK FLOW (cms)=	0.28	0.03	0.311 (iii)
TIME TO PEAK (hrs)=	1.33	1.37	1.33
RUNOFF VOLUME (mm)=	69.32	26.20	58.10
TOTAL RAINFALL (mm)=	70.32	70.32	70.32
RUNOFF COEFFICIENT =	0.99	0.37	0.83

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0011) / 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	0.0912	0.0179
	0.0006	0.0005	0.1027	0.0204
	0.0062	0.0056	0.1264	0.0248
	0.0100	0.0060	0.1349	0.0263
	0.0470	0.0101	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0006)	0.750	0.311	1.33	58.10
OUTFLOW: ID= 1 (0011)	0.750	0.102	1.45	57.82

PEAK FLOW REDUCTION [Qout/Qin](%)= 32.73
TIME SHIFT OF PEAK FLOW (min)= 7.00
MAXIMUM STORAGE USED (ha.m.)= 0.0202

CALIB / STANDHYD (0008) / ID= 1 DT= 1.0 min	Area (ha)= 2.20		Total Imp(%)= 59.00	Dir. Conn.(%)= 45.00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.30	0.90	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	121.11	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	4.16	1.017	32.64	2.017	9.72	3.02	4.94
0.033	4.16	1.033	32.64	2.033	9.72	3.03	4.94
0.050	4.16	1.050	32.64	2.050	9.72	3.05	4.94

0.067	4.16	1.067	32.64	2.067	9.72	3.07	4.94
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.100	4.16	1.100	32.64	2.100	9.72	3.10	4.94
0.117	4.16	1.117	32.64	2.117	9.72	3.12	4.94
0.133	4.16	1.133	32.64	2.133	9.72	3.13	4.94
0.150	4.16	1.150	32.64	2.150	9.72	3.15	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.183	4.76	1.183	184.61	2.183	8.29	3.18	4.59
0.200	4.76	1.200	184.62	2.200	8.29	3.20	4.59
0.217	4.76	1.217	184.62	2.217	8.29	3.22	4.59
0.233	4.76	1.233	184.62	2.233	8.29	3.23	4.59
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.267	4.76	1.267	184.62	2.267	8.29	3.27	4.59
0.283	4.76	1.283	184.62	2.283	8.29	3.28	4.59
0.300	4.76	1.300	184.62	2.300	8.29	3.30	4.59
0.317	4.76	1.317	184.62	2.317	8.29	3.32	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.350	5.60	1.350	43.10	2.350	7.26	3.35	4.29
0.367	5.60	1.367	43.10	2.367	7.26	3.37	4.29
0.383	5.60	1.383	43.10	2.383	7.26	3.38	4.29
0.400	5.60	1.400	43.10	2.400	7.26	3.40	4.29
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29
0.433	5.60	1.433	43.10	2.433	7.26	3.43	4.29
0.450	5.60	1.450	43.10	2.450	7.26	3.45	4.29
0.467	5.60	1.467	43.10	2.467	7.26	3.47	4.29
0.483	5.60	1.483	43.10	2.483	7.26	3.48	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.517	6.86	1.517	22.23	2.517	6.47	3.52	4.03
0.533	6.86	1.533	22.23	2.533	6.47	3.53	4.03
0.550	6.86	1.550	22.23	2.550	6.47	3.55	4.03
0.567	6.86	1.567	22.23	2.567	6.47	3.57	4.03
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.600	6.86	1.600	22.23	2.600	6.47	3.60	4.03
0.617	6.86	1.617	22.23	2.617	6.47	3.62	4.03
0.633	6.86	1.633	22.23	2.633	6.47	3.63	4.03
0.650	6.86	1.650	22.23	2.650	6.47	3.65	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.683	9.00	1.683	15.32	2.683	5.85	3.68	3.81
0.700	9.00	1.700	15.32	2.700	5.85	3.70	3.81
0.717	9.00	1.717	15.32	2.717	5.85	3.72	3.81
0.733	9.00	1.733	15.32	2.733	5.85	3.73	3.81
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.767	9.00	1.767	15.32	2.767	5.85	3.77	3.81
0.783	9.00	1.783	15.32	2.783	5.85	3.78	3.81
0.800	9.00	1.800	15.32	2.800	5.85	3.80	3.81
0.817	9.00	1.817	15.32	2.817	5.85	3.82	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.850	13.56	1.850	11.84	2.850	5.35	3.85	3.61
0.867	13.56	1.867	11.84	2.867	5.35	3.87	3.61
0.883	13.56	1.883	11.84	2.883	5.35	3.88	3.61
0.900	13.56	1.900	11.84	2.900	5.35	3.90	3.61
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
0.933	13.56	1.933	11.84	2.933	5.35	3.93	3.61
0.950	13.56	1.950	11.84	2.950	5.35	3.95	3.61
0.967	13.56	1.967	11.84	2.967	5.35	3.97	3.61
0.983	13.56	1.983	11.84	2.983	5.35	3.98	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Max.Eff.Inten.(mm/hr)=	184.62	47.39	
over (min)	5.00	8.00	
Storage Coeff. (min)=	2.24 (ii)	7.56 (ii)	
Unit Hyd. Tpeak (min)=	5.00	8.00	
Unit Hyd. peak (cms)=	0.36	0.15	
			TOTALS
PEAK FLOW (cms)=	0.49	0.08	0.548 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	69.32	15.83	39.90
TOTAL RAINFALL (mm)=	70.32	70.32	70.32
RUNOFF COEFFICIENT =	0.99	0.23	0.57

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| RESERVOIR(0010)| OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 1.0 min | OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0570 0.0442
0.0008 0.0012 | 0.0640 0.0503
0.0063 0.0138 | 0.0780 0.0611
0.0090 0.0149 | 0.0830 0.0649
0.0320 0.0249 | 0.0000 0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)	2.200	0.548	1.33	39.90
OUTFLOW: ID= 1 (0010)	2.200	0.068	1.85	39.72

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.36
TIME SHIFT OF PEAK FLOW (min)= 31.00
MAXIMUM STORAGE USED (ha.m.)= 0.0532

| CALIB | STANDHYD (0039)| ID= 1 DT= 5.0 min |

Area (ha)= 0.08
Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.04
Dep. Storage (mm)=	1.00	2.30
Average Slope (%)=	1.00	2.00
Length (m)=	23.09	40.00
Mannings n =	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	4.16	1.083	32.64	2.083	9.72	3.08	4.94
0.167	4.16	1.167	32.64	2.167	9.72	3.17	4.94
0.250	4.76	1.250	184.62	2.250	8.29	3.25	4.59
0.333	4.76	1.333	184.62	2.333	8.29	3.33	4.59
0.417	5.60	1.417	43.10	2.417	7.26	3.42	4.29
0.500	5.60	1.500	43.10	2.500	7.26	3.50	4.29
0.583	6.86	1.583	22.23	2.583	6.47	3.58	4.03
0.667	6.86	1.667	22.23	2.667	6.47	3.67	4.03
0.750	9.00	1.750	15.32	2.750	5.85	3.75	3.81
0.833	9.00	1.833	15.32	2.833	5.85	3.83	3.81
0.917	13.56	1.917	11.84	2.917	5.35	3.92	3.61
1.000	13.56	2.000	11.84	3.000	5.35	4.00	3.61

Max.Eff.Inten.(mm/hr)=	184.62	210.67	
over (min)	5.00	10.00	
Storage Coeff. (min)=	0.83 (ii)	6.07 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.15	
			TOTALS
PEAK FLOW (cms)=	0.01	0.02	0.030 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	69.32	58.00	61.91
TOTAL RAINFALL (mm)=	70.32	70.32	70.32
RUNOFF COEFFICIENT =	0.99	0.82	0.88

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 94.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0004)| | 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	2.20	0.068	1.85	39.72
+ ID2= 2 (0011):	0.75	0.102	1.45	57.82

```
       ================================================
       ID = 3 (  0004):     2.95   0.162     1.55    44.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):     2.95   0.162     1.55    44.33
     + ID2= 2 (  0027):    16.11   0.332     2.52    18.44
       ================================================
       ID = 1 (  0004):    19.06   0.423     2.37    22.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    19.06   0.423     2.37    22.45
     + ID2= 2 (  0003):     4.63   0.020     4.08    26.91
       ================================================
       ID = 3 (  0004):    23.69   0.441     2.37    23.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):    23.69   0.441     2.37    23.32
     + ID2= 2 (  0039):     0.08   0.030     1.33    61.91
       ================================================
       ID = 1 (  0004):    23.77   0.443     2.37    23.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    23.77   0.443     2.37    23.45
     + ID2= 2 (  0009):     2.02   0.301     1.42    39.54
       ================================================
       ID = 3 (  0004):    25.79   0.516     1.42    24.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  ********************************************
  ** SIMULATION : Run 06                     **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1770.000
| Ptotal= 78.03 mm |                          B=   4.000
--------------------                          C=   0.820
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    4.34 |  1.17   38.21 |  2.17   10.60 |  3.17    5.19
                0.33    5.00 |  1.33  203.31 |  2.33    8.96 |  3.33    4.81
                0.50    5.92 |  1.50   50.96 |  2.50    7.78 |  3.50    4.48
                0.67    7.33 |  1.67   25.51 |  2.67    6.90 |  3.67    4.20
                0.83    9.77 |  1.83   17.18 |  2.83    6.21 |  3.83    3.96
                1.00   15.10 |  2.00   13.06 |  3.00    5.65 |  4.00    3.74


--------------------------------------------------------------------------------
--------------------
```

```
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

        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	4.34	1.017	38.21	2.017	10.60	3.02	5.19
0.033	4.34	1.033	38.21	2.033	10.60	3.03	5.19
0.050	4.34	1.050	38.21	2.050	10.60	3.05	5.19
0.067	4.34	1.067	38.21	2.067	10.60	3.07	5.19
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.100	4.34	1.100	38.21	2.100	10.60	3.10	5.19
0.117	4.34	1.117	38.21	2.117	10.60	3.12	5.19
0.133	4.34	1.133	38.21	2.133	10.60	3.13	5.19
0.150	4.34	1.150	38.21	2.150	10.60	3.15	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.183	5.00	1.183	203.30	2.183	8.96	3.18	4.81
0.200	5.00	1.200	203.31	2.200	8.96	3.20	4.81
0.217	5.00	1.217	203.31	2.217	8.96	3.22	4.81
0.233	5.00	1.233	203.31	2.233	8.96	3.23	4.81
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.267	5.00	1.267	203.31	2.267	8.96	3.27	4.81
0.283	5.00	1.283	203.31	2.283	8.96	3.28	4.81
0.300	5.00	1.300	203.31	2.300	8.96	3.30	4.81
0.317	5.00	1.317	203.31	2.317	8.96	3.32	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.350	5.92	1.350	50.97	2.350	7.78	3.35	4.48
0.367	5.92	1.367	50.96	2.367	7.78	3.37	4.48
0.383	5.92	1.383	50.96	2.383	7.78	3.38	4.48
0.400	5.92	1.400	50.96	2.400	7.78	3.40	4.48
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20
0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96
0.783	9.77	1.783	17.18	2.783	6.21	3.78	3.96
0.800	9.77	1.800	17.18	2.800	6.21	3.80	3.96
0.817	9.77	1.817	17.18	2.817	6.21	3.82	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.850	15.10	1.850	13.06	2.850	5.65	3.85	3.74
0.867	15.10	1.867	13.06	2.867	5.65	3.87	3.74
0.883	15.10	1.883	13.06	2.883	5.65	3.88	3.74
0.900	15.10	1.900	13.06	2.900	5.65	3.90	3.74
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
0.933	15.10	1.933	13.06	2.933	5.65	3.93	3.74
0.950	15.10	1.950	13.06	2.950	5.65	3.95	3.74
0.967	15.10	1.967	13.06	2.967	5.65	3.97	3.74
0.983	15.10	1.983	13.06	2.983	5.65	3.98	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

```
    Unit Hyd Qpeak  (cms)=   0.161

    PEAK FLOW       (cms)=   0.094 (i)
    TIME TO PEAK    (hrs)=   1.700
    RUNOFF VOLUME    (mm)=  26.916
    TOTAL RAINFALL   (mm)=  78.027
    RUNOFF COEFFICIENT   =   0.345
```

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

CALIB	Area (ha)= 2.91		
STANDHYD (0001)	Total Imp(%)= 56.00	Dir. Conn.(%)= 51.00	
ID= 1 DT= 1.0 min			

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	4.34	1.017	38.21	2.017	10.60	3.02	5.19
0.033	4.34	1.033	38.21	2.033	10.60	3.03	5.19
0.050	4.34	1.050	38.21	2.050	10.60	3.05	5.19
0.067	4.34	1.067	38.21	2.067	10.60	3.07	5.19
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.100	4.34	1.100	38.21	2.100	10.60	3.10	5.19
0.117	4.34	1.117	38.21	2.117	10.60	3.12	5.19
0.133	4.34	1.133	38.21	2.133	10.60	3.13	5.19
0.150	4.34	1.150	38.21	2.150	10.60	3.15	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.183	5.00	1.183	203.30	2.183	8.96	3.18	4.81
0.200	5.00	1.200	203.31	2.200	8.96	3.20	4.81
0.217	5.00	1.217	203.31	2.217	8.96	3.22	4.81
0.233	5.00	1.233	203.31	2.233	8.96	3.23	4.81
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.267	5.00	1.267	203.31	2.267	8.96	3.27	4.81
0.283	5.00	1.283	203.31	2.283	8.96	3.28	4.81
0.300	5.00	1.300	203.31	2.300	8.96	3.30	4.81
0.317	5.00	1.317	203.31	2.317	8.96	3.32	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.350	5.92	1.350	50.97	2.350	7.78	3.35	4.48
0.367	5.92	1.367	50.96	2.367	7.78	3.37	4.48
0.383	5.92	1.383	50.96	2.383	7.78	3.38	4.48
0.400	5.92	1.400	50.96	2.400	7.78	3.40	4.48
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20
0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96
0.783	9.77	1.783	17.18	2.783	6.21	3.78	3.96
0.800	9.77	1.800	17.18	2.800	6.21	3.80	3.96
0.817	9.77	1.817	17.18	2.817	6.21	3.82	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.850	15.10	1.850	13.06	2.850	5.65	3.85	3.74
0.867	15.10	1.867	13.06	2.867	5.65	3.87	3.74
0.883	15.10	1.883	13.06	2.883	5.65	3.88	3.74
0.900	15.10	1.900	13.06	2.900	5.65	3.90	3.74
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
0.933	15.10	1.933	13.06	2.933	5.65	3.93	3.74
0.950	15.10	1.950	13.06	2.950	5.65	3.95	3.74

0.967	15.10	1.967	13.06	2.967	5.65	3.97	3.74
0.983	15.10	1.983	13.06	2.983	5.65	3.98	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Max.Eff.Inten.(mm/hr)=	203.31	39.96	
over (min)	5.00	7.00	
Storage Coeff. (min)=	2.08 (ii)	6.51 (ii)	
Unit Hyd. Tpeak (min)=	5.00	7.00	
Unit Hyd. peak (cms)=	0.37	0.17	
			TOTALS
PEAK FLOW (cms)=	0.82	0.11	0.899 (iii)
TIME TO PEAK (hrs)=	1.33	1.40	1.33
RUNOFF VOLUME (mm)=	77.03	16.35	47.29
TOTAL RAINFALL (mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT =	0.99	0.21	0.61

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0028)	Area (ha)=	0.29	
ID= 1 DT= 1.0 min	Total Imp(%)=	67.00	Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	4.34	1.017	38.21	2.017	10.60	3.02	5.19
0.033	4.34	1.033	38.21	2.033	10.60	3.03	5.19
0.050	4.34	1.050	38.21	2.050	10.60	3.05	5.19
0.067	4.34	1.067	38.21	2.067	10.60	3.07	5.19
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.100	4.34	1.100	38.21	2.100	10.60	3.10	5.19
0.117	4.34	1.117	38.21	2.117	10.60	3.12	5.19
0.133	4.34	1.133	38.21	2.133	10.60	3.13	5.19
0.150	4.34	1.150	38.21	2.150	10.60	3.15	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.183	5.00	1.183	203.30	2.183	8.96	3.18	4.81
0.200	5.00	1.200	203.31	2.200	8.96	3.20	4.81
0.217	5.00	1.217	203.31	2.217	8.96	3.22	4.81
0.233	5.00	1.233	203.31	2.233	8.96	3.23	4.81
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.267	5.00	1.267	203.31	2.267	8.96	3.27	4.81
0.283	5.00	1.283	203.31	2.283	8.96	3.28	4.81
0.300	5.00	1.300	203.31	2.300	8.96	3.30	4.81
0.317	5.00	1.317	203.31	2.317	8.96	3.32	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.350	5.92	1.350	50.97	2.350	7.78	3.35	4.48
0.367	5.92	1.367	50.96	2.367	7.78	3.37	4.48
0.383	5.92	1.383	50.96	2.383	7.78	3.38	4.48
0.400	5.92	1.400	50.96	2.400	7.78	3.40	4.48
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20

0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96
0.783	9.77	1.783	17.18	2.783	6.21	3.78	3.96
0.800	9.77	1.800	17.18	2.800	6.21	3.80	3.96
0.817	9.77	1.817	17.18	2.817	6.21	3.82	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.850	15.10	1.850	13.06	2.850	5.65	3.85	3.74
0.867	15.10	1.867	13.06	2.867	5.65	3.87	3.74
0.883	15.10	1.883	13.06	2.883	5.65	3.88	3.74
0.900	15.10	1.900	13.06	2.900	5.65	3.90	3.74
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
0.933	15.10	1.933	13.06	2.933	5.65	3.93	3.74
0.950	15.10	1.950	13.06	2.950	5.65	3.95	3.74
0.967	15.10	1.967	13.06	2.967	5.65	3.97	3.74
0.983	15.10	1.983	13.06	2.983	5.65	3.98	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Max.Eff.Inten.(mm/hr)=	203.31	32.17		
over (min)	5.00	6.00		
Storage Coeff. (min)=	1.17 (ii)	5.18 (ii)		
Unit Hyd. Tpeak (min)=	5.00	6.00		
Unit Hyd. peak (cms)=	0.45	0.21		
			TOTALS	
PEAK FLOW (cms)=	0.11	0.01	0.116 (iii)	
TIME TO PEAK (hrs)=	1.33	1.38	1.33	
RUNOFF VOLUME (mm)=	77.03	14.84	56.49	
TOTAL RAINFALL (mm)=	78.03	78.03	78.03	
RUNOFF COEFFICIENT =	0.99	0.19	0.72	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0016)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0001):	2.91	0.899	1.33	47.29	
+ ID2= 2 (0025):	1.43	0.094	1.70	26.92	
ID = 3 (0016):	4.34	0.920	1.33	40.58	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0016)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0016):	4.34	0.920	1.33	40.58	
+ ID2= 2 (0028):	0.29	0.116	1.33	56.49	
ID = 1 (0016):	4.63	1.035	1.33	41.58	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0003)	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	0.0130	0.0895
	0.0000	0.0291	0.0210	0.1555
	0.0010	0.0332	0.0230	0.1780
	0.0040	0.0496	0.0280	0.2176
	0.0050	0.0537	0.0300	0.2309

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0016)	4.630	1.035	1.33	41.58
OUTFLOW: ID= 1 (0003)	4.630	0.022	4.08	31.35

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.16
TIME SHIFT OF PEAK FLOW (min)=165.00
MAXIMUM STORAGE USED (ha.m.)= 0.1709

CALIB			
NASHYD (0026)	Area (ha)= 0.27	Curve Number (CN)= 71.0	
ID= 1 DT= 1.0 min	Ia (mm)= 3.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.02		

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	4.34	1.017	38.21	2.017	10.60	3.02	5.19
0.033	4.34	1.033	38.21	2.033	10.60	3.03	5.19
0.050	4.34	1.050	38.21	2.050	10.60	3.05	5.19
0.067	4.34	1.067	38.21	2.067	10.60	3.07	5.19
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.100	4.34	1.100	38.21	2.100	10.60	3.10	5.19
0.117	4.34	1.117	38.21	2.117	10.60	3.12	5.19
0.133	4.34	1.133	38.21	2.133	10.60	3.13	5.19
0.150	4.34	1.150	38.21	2.150	10.60	3.15	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.183	5.00	1.183	203.30	2.183	8.96	3.18	4.81
0.200	5.00	1.200	203.31	2.200	8.96	3.20	4.81
0.217	5.00	1.217	203.31	2.217	8.96	3.22	4.81
0.233	5.00	1.233	203.31	2.233	8.96	3.23	4.81
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.267	5.00	1.267	203.31	2.267	8.96	3.27	4.81
0.283	5.00	1.283	203.31	2.283	8.96	3.28	4.81
0.300	5.00	1.300	203.31	2.300	8.96	3.30	4.81
0.317	5.00	1.317	203.31	2.317	8.96	3.32	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.350	5.92	1.350	50.97	2.350	7.78	3.35	4.48
0.367	5.92	1.367	50.96	2.367	7.78	3.37	4.48
0.383	5.92	1.383	50.96	2.383	7.78	3.38	4.48
0.400	5.92	1.400	50.96	2.400	7.78	3.40	4.48
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20
0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96
0.783	9.77	1.783	17.18	2.783	6.21	3.78	3.96
0.800	9.77	1.800	17.18	2.800	6.21	3.80	3.96
0.817	9.77	1.817	17.18	2.817	6.21	3.82	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.850	15.10	1.850	13.06	2.850	5.65	3.85	3.74
0.867	15.10	1.867	13.06	2.867	5.65	3.87	3.74
0.883	15.10	1.883	13.06	2.883	5.65	3.88	3.74
0.900	15.10	1.900	13.06	2.900	5.65	3.90	3.74
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
0.933	15.10	1.933	13.06	2.933	5.65	3.93	3.74
0.950	15.10	1.950	13.06	2.950	5.65	3.95	3.74

0.967	15.10	1.967	13.06	2.967	5.65	3.97	3.74
0.983	15.10	1.983	13.06	2.983	5.65	3.98	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.072 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 30.669
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.393

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

CALIB
STANDHYD (0007)
ID= 1 DT= 1.0 min

Area (ha)= 1.75
Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	4.34	1.017	38.21	2.017	10.60	3.02	5.19
0.033	4.34	1.033	38.21	2.033	10.60	3.03	5.19
0.050	4.34	1.050	38.21	2.050	10.60	3.05	5.19
0.067	4.34	1.067	38.21	2.067	10.60	3.07	5.19
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.100	4.34	1.100	38.21	2.100	10.60	3.10	5.19
0.117	4.34	1.117	38.21	2.117	10.60	3.12	5.19
0.133	4.34	1.133	38.21	2.133	10.60	3.13	5.19
0.150	4.34	1.150	38.21	2.150	10.60	3.15	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.183	5.00	1.183	203.30	2.183	8.96	3.18	4.81
0.200	5.00	1.200	203.31	2.200	8.96	3.20	4.81
0.217	5.00	1.217	203.31	2.217	8.96	3.22	4.81
0.233	5.00	1.233	203.31	2.233	8.96	3.23	4.81
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.267	5.00	1.267	203.31	2.267	8.96	3.27	4.81
0.283	5.00	1.283	203.31	2.283	8.96	3.28	4.81
0.300	5.00	1.300	203.31	2.300	8.96	3.30	4.81
0.317	5.00	1.317	203.31	2.317	8.96	3.32	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.350	5.92	1.350	50.97	2.350	7.78	3.35	4.48
0.367	5.92	1.367	50.96	2.367	7.78	3.37	4.48
0.383	5.92	1.383	50.96	2.383	7.78	3.38	4.48
0.400	5.92	1.400	50.96	2.400	7.78	3.40	4.48
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20
0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96

```
               0.783    9.77 | 1.783   17.18 | 2.783    6.21 |  3.78    3.96
               0.800    9.77 | 1.800   17.18 | 2.800    6.21 |  3.80    3.96
               0.817    9.77 | 1.817   17.18 | 2.817    6.21 |  3.82    3.96
               0.833    9.77 | 1.833   17.18 | 2.833    6.21 |  3.83    3.96
               0.850   15.10 | 1.850   13.06 | 2.850    5.65 |  3.85    3.74
               0.867   15.10 | 1.867   13.06 | 2.867    5.65 |  3.87    3.74
               0.883   15.10 | 1.883   13.06 | 2.883    5.65 |  3.88    3.74
               0.900   15.10 | 1.900   13.06 | 2.900    5.65 |  3.90    3.74
               0.917   15.10 | 1.917   13.06 | 2.917    5.65 |  3.92    3.74
               0.933   15.10 | 1.933   13.06 | 2.933    5.65 |  3.93    3.74
               0.950   15.10 | 1.950   13.06 | 2.950    5.65 |  3.95    3.74
               0.967   15.10 | 1.967   13.06 | 2.967    5.65 |  3.97    3.74
               0.983   15.10 | 1.983   13.06 | 2.983    5.65 |  3.98    3.74
               1.000   15.10 | 2.000   13.06 | 3.000    5.65 |  4.00    3.74

     Max.Eff.Inten.(mm/hr)=     203.31        43.83
               over (min)        5.00         7.00
     Storage Coeff.  (min)=       2.01 (ii)    6.93 (ii)
     Unit Hyd. Tpeak (min)=       5.00         7.00
     Unit Hyd. peak  (cms)=       0.37         0.16
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.49         0.07          0.543 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      77.03        17.03          47.63
     TOTAL RAINFALL   (mm)=      78.03        78.03          78.03
     RUNOFF COEFFICIENT   =       0.99         0.22           0.61


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0026):     0.27   0.072     1.33    30.67
     + ID2= 2 (  0007):     1.75   0.543     1.33    47.63
       ================================================
       ID = 3 (  0018):     2.02   0.614     1.33    45.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0009)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0007   |   0.0212      0.0291
                          0.0037     0.0045   |   0.0402      0.0316
                          0.0053     0.0065   |   0.1203      0.0341
                          0.0081     0.0128   |   0.2476      0.0366
                          0.0101     0.0188   |   0.3901      0.0373
                          0.0118     0.0250   |   0.4841      0.0381
                          0.0126     0.0279   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020      0.614      1.33      45.36
   OUTFLOW: ID= 1 (  0009)      2.020      0.448      1.40      44.89

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 72.96
                  TIME SHIFT OF PEAK FLOW         (min)=  4.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0379

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.95

         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	4.34	1.017	38.21	2.017	10.60	3.02	5.19
0.033	4.34	1.033	38.21	2.033	10.60	3.03	5.19
0.050	4.34	1.050	38.21	2.050	10.60	3.05	5.19
0.067	4.34	1.067	38.21	2.067	10.60	3.07	5.19
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.100	4.34	1.100	38.21	2.100	10.60	3.10	5.19
0.117	4.34	1.117	38.21	2.117	10.60	3.12	5.19
0.133	4.34	1.133	38.21	2.133	10.60	3.13	5.19
0.150	4.34	1.150	38.21	2.150	10.60	3.15	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.183	5.00	1.183	203.30	2.183	8.96	3.18	4.81
0.200	5.00	1.200	203.31	2.200	8.96	3.20	4.81
0.217	5.00	1.217	203.31	2.217	8.96	3.22	4.81
0.233	5.00	1.233	203.31	2.233	8.96	3.23	4.81
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.267	5.00	1.267	203.31	2.267	8.96	3.27	4.81
0.283	5.00	1.283	203.31	2.283	8.96	3.28	4.81
0.300	5.00	1.300	203.31	2.300	8.96	3.30	4.81
0.317	5.00	1.317	203.31	2.317	8.96	3.32	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.350	5.92	1.350	50.97	2.350	7.78	3.35	4.48
0.367	5.92	1.367	50.96	2.367	7.78	3.37	4.48
0.383	5.92	1.383	50.96	2.383	7.78	3.38	4.48
0.400	5.92	1.400	50.96	2.400	7.78	3.40	4.48
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20
0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96
0.783	9.77	1.783	17.18	2.783	6.21	3.78	3.96
0.800	9.77	1.800	17.18	2.800	6.21	3.80	3.96
0.817	9.77	1.817	17.18	2.817	6.21	3.82	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.850	15.10	1.850	13.06	2.850	5.65	3.85	3.74
0.867	15.10	1.867	13.06	2.867	5.65	3.87	3.74
0.883	15.10	1.883	13.06	2.883	5.65	3.88	3.74
0.900	15.10	1.900	13.06	2.900	5.65	3.90	3.74
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
0.933	15.10	1.933	13.06	2.933	5.65	3.93	3.74
0.950	15.10	1.950	13.06	2.950	5.65	3.95	3.74
0.967	15.10	1.967	13.06	2.967	5.65	3.97	3.74
0.983	15.10	1.983	13.06	2.983	5.65	3.98	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.410 (i)
TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 22.339
TOTAL RAINFALL (mm)= 78.027
RUNOFF COEFFICIENT = 0.286

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

CALIB	STANDHYD (0006)	ID= 1 DT= 1.0 min

Area (ha)= 0.75
Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	4.34	1.017	38.21	2.017	10.60	3.02	5.19
0.033	4.34	1.033	38.21	2.033	10.60	3.03	5.19
0.050	4.34	1.050	38.21	2.050	10.60	3.05	5.19
0.067	4.34	1.067	38.21	2.067	10.60	3.07	5.19
0.083	4.34	1.083	38.21	2.083	10.60	3.08	5.19
0.100	4.34	1.100	38.21	2.100	10.60	3.10	5.19
0.117	4.34	1.117	38.21	2.117	10.60	3.12	5.19
0.133	4.34	1.133	38.21	2.133	10.60	3.13	5.19
0.150	4.34	1.150	38.21	2.150	10.60	3.15	5.19
0.167	4.34	1.167	38.21	2.167	10.60	3.17	5.19
0.183	5.00	1.183	203.30	2.183	8.96	3.18	4.81
0.200	5.00	1.200	203.31	2.200	8.96	3.20	4.81
0.217	5.00	1.217	203.31	2.217	8.96	3.22	4.81
0.233	5.00	1.233	203.31	2.233	8.96	3.23	4.81
0.250	5.00	1.250	203.31	2.250	8.96	3.25	4.81
0.267	5.00	1.267	203.31	2.267	8.96	3.27	4.81
0.283	5.00	1.283	203.31	2.283	8.96	3.28	4.81
0.300	5.00	1.300	203.31	2.300	8.96	3.30	4.81
0.317	5.00	1.317	203.31	2.317	8.96	3.32	4.81
0.333	5.00	1.333	203.31	2.333	8.96	3.33	4.81
0.350	5.92	1.350	50.97	2.350	7.78	3.35	4.48
0.367	5.92	1.367	50.96	2.367	7.78	3.37	4.48
0.383	5.92	1.383	50.96	2.383	7.78	3.38	4.48
0.400	5.92	1.400	50.96	2.400	7.78	3.40	4.48
0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20
0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96
0.783	9.77	1.783	17.18	2.783	6.21	3.78	3.96
0.800	9.77	1.800	17.18	2.800	6.21	3.80	3.96
0.817	9.77	1.817	17.18	2.817	6.21	3.82	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.850	15.10	1.850	13.06	2.850	5.65	3.85	3.74
0.867	15.10	1.867	13.06	2.867	5.65	3.87	3.74
0.883	15.10	1.883	13.06	2.883	5.65	3.88	3.74
0.900	15.10	1.900	13.06	2.900	5.65	3.90	3.74
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
0.933	15.10	1.933	13.06	2.933	5.65	3.93	3.74
0.950	15.10	1.950	13.06	2.950	5.65	3.95	3.74
0.967	15.10	1.967	13.06	2.967	5.65	3.97	3.74
0.983	15.10	1.983	13.06	2.983	5.65	3.98	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Max.Eff.Inten.(mm/hr)=		203.31	193.81
	over (min)	5.00	4.00
Storage Coeff.	(min)=	1.56 (ii)	3.95 (ii)
Unit Hyd. Tpeak	(min)=	5.00	4.00

```
     Unit Hyd. peak  (cms)=       0.41         0.28
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.31         0.04          0.348 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.35           1.33
     RUNOFF VOLUME    (mm)=      77.03        31.09          65.08
     TOTAL RAINFALL   (mm)=      78.03        78.03          78.03
     RUNOFF COEFFICIENT   =       0.99         0.40           0.83


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0011)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0912      0.0179
                          0.0006     0.0005   |   0.1027      0.0204
                          0.0062     0.0056   |   0.1264      0.0248
                          0.0100     0.0060   |   0.1349      0.0263
                          0.0470     0.0101   |   0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0006)     0.750      0.348      1.33      65.08
   OUTFLOW: ID= 1 (  0011)     0.750      0.114      1.45      64.80

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 32.86
                  TIME SHIFT OF PEAK FLOW         (min)=  7.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0226

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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    4.34 | 1.017   38.21 | 2.017   10.60 |  3.02    5.19
              0.033    4.34 | 1.033   38.21 | 2.033   10.60 |  3.03    5.19
              0.050    4.34 | 1.050   38.21 | 2.050   10.60 |  3.05    5.19
              0.067    4.34 | 1.067   38.21 | 2.067   10.60 |  3.07    5.19
              0.083    4.34 | 1.083   38.21 | 2.083   10.60 |  3.08    5.19
              0.100    4.34 | 1.100   38.21 | 2.100   10.60 |  3.10    5.19
              0.117    4.34 | 1.117   38.21 | 2.117   10.60 |  3.12    5.19
              0.133    4.34 | 1.133   38.21 | 2.133   10.60 |  3.13    5.19
              0.150    4.34 | 1.150   38.21 | 2.150   10.60 |  3.15    5.19
              0.167    4.34 | 1.167   38.21 | 2.167   10.60 |  3.17    5.19
              0.183    5.00 | 1.183  203.30 | 2.183    8.96 |  3.18    4.81
              0.200    5.00 | 1.200  203.31 | 2.200    8.96 |  3.20    4.81
              0.217    5.00 | 1.217  203.31 | 2.217    8.96 |  3.22    4.81
              0.233    5.00 | 1.233  203.31 | 2.233    8.96 |  3.23    4.81
              0.250    5.00 | 1.250  203.31 | 2.250    8.96 |  3.25    4.81
              0.267    5.00 | 1.267  203.31 | 2.267    8.96 |  3.27    4.81
              0.283    5.00 | 1.283  203.31 | 2.283    8.96 |  3.28    4.81
              0.300    5.00 | 1.300  203.31 | 2.300    8.96 |  3.30    4.81
              0.317    5.00 | 1.317  203.31 | 2.317    8.96 |  3.32    4.81
              0.333    5.00 | 1.333  203.31 | 2.333    8.96 |  3.33    4.81
              0.350    5.92 | 1.350   50.97 | 2.350    7.78 |  3.35    4.48
              0.367    5.92 | 1.367   50.96 | 2.367    7.78 |  3.37    4.48
              0.383    5.92 | 1.383   50.96 | 2.383    7.78 |  3.38    4.48
              0.400    5.92 | 1.400   50.96 | 2.400    7.78 |  3.40    4.48
```

0.417	5.92	1.417	50.96	2.417	7.78	3.42	4.48
0.433	5.92	1.433	50.96	2.433	7.78	3.43	4.48
0.450	5.92	1.450	50.96	2.450	7.78	3.45	4.48
0.467	5.92	1.467	50.96	2.467	7.78	3.47	4.48
0.483	5.92	1.483	50.96	2.483	7.78	3.48	4.48
0.500	5.92	1.500	50.96	2.500	7.78	3.50	4.48
0.517	7.33	1.517	25.51	2.517	6.90	3.52	4.20
0.533	7.33	1.533	25.51	2.533	6.90	3.53	4.20
0.550	7.33	1.550	25.51	2.550	6.90	3.55	4.20
0.567	7.33	1.567	25.51	2.567	6.90	3.57	4.20
0.583	7.33	1.583	25.51	2.583	6.90	3.58	4.20
0.600	7.33	1.600	25.51	2.600	6.90	3.60	4.20
0.617	7.33	1.617	25.51	2.617	6.90	3.62	4.20
0.633	7.33	1.633	25.51	2.633	6.90	3.63	4.20
0.650	7.33	1.650	25.51	2.650	6.90	3.65	4.20
0.667	7.33	1.667	25.51	2.667	6.90	3.67	4.20
0.683	9.77	1.683	17.18	2.683	6.21	3.68	3.96
0.700	9.77	1.700	17.18	2.700	6.21	3.70	3.96
0.717	9.77	1.717	17.18	2.717	6.21	3.72	3.96
0.733	9.77	1.733	17.18	2.733	6.21	3.73	3.96
0.750	9.77	1.750	17.18	2.750	6.21	3.75	3.96
0.767	9.77	1.767	17.18	2.767	6.21	3.77	3.96
0.783	9.77	1.783	17.18	2.783	6.21	3.78	3.96
0.800	9.77	1.800	17.18	2.800	6.21	3.80	3.96
0.817	9.77	1.817	17.18	2.817	6.21	3.82	3.96
0.833	9.77	1.833	17.18	2.833	6.21	3.83	3.96
0.850	15.10	1.850	13.06	2.850	5.65	3.85	3.74
0.867	15.10	1.867	13.06	2.867	5.65	3.87	3.74
0.883	15.10	1.883	13.06	2.883	5.65	3.88	3.74
0.900	15.10	1.900	13.06	2.900	5.65	3.90	3.74
0.917	15.10	1.917	13.06	2.917	5.65	3.92	3.74
0.933	15.10	1.933	13.06	2.933	5.65	3.93	3.74
0.950	15.10	1.950	13.06	2.950	5.65	3.95	3.74
0.967	15.10	1.967	13.06	2.967	5.65	3.97	3.74
0.983	15.10	1.983	13.06	2.983	5.65	3.98	3.74
1.000	15.10	2.000	13.06	3.000	5.65	4.00	3.74

Max.Eff.Inten.(mm/hr)=	203.31	57.61	
over (min)	5.00	8.00	
Storage Coeff. (min)=	2.16 (ii)	7.28 (ii)	
Unit Hyd. Tpeak (min)=	5.00	8.00	
Unit Hyd. peak (cms)=	0.36	0.15	
			TOTALS
PEAK FLOW (cms)=	0.54	0.10	0.615 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	77.03	19.18	45.21
TOTAL RAINFALL (mm)=	78.03	78.03	78.03
RUNOFF COEFFICIENT =	0.99	0.25	0.58

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)	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	0.0570	0.0442
	0.0008	0.0012	0.0640	0.0503
	0.0063	0.0138	0.0780	0.0611
	0.0090	0.0149	0.0830	0.0649
	0.0320	0.0249	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)	2.200	0.615	1.33	45.21
OUTFLOW: ID= 1 (0010)	2.200	0.078	1.85	45.04

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.63
TIME SHIFT OF PEAK FLOW (min)= 31.00
MAXIMUM STORAGE USED (ha.m.)= 0.0609

```
| CALIB            |
| STANDHYD (  0039)|   Area    (ha)=   0.08
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.04
     Dep. Storage     (mm)=       1.00         2.30
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      23.09        40.00
     Mannings n           =      0.013        0.250

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    4.34 | 1.083   38.21 | 2.083   10.60 |  3.08    5.19
               0.167    4.34 | 1.167   38.21 | 2.167   10.60 |  3.17    5.19
               0.250    5.00 | 1.250  203.30 | 2.250    8.96 |  3.25    4.81
               0.333    5.00 | 1.333  203.31 | 2.333    8.96 |  3.33    4.81
               0.417    5.92 | 1.417   50.96 | 2.417    7.78 |  3.42    4.48
               0.500    5.92 | 1.500   50.96 | 2.500    7.78 |  3.50    4.48
               0.583    7.33 | 1.583   25.51 | 2.583    6.90 |  3.58    4.20
               0.667    7.33 | 1.667   25.51 | 2.667    6.90 |  3.67    4.20
               0.750    9.77 | 1.750   17.18 | 2.750    6.21 |  3.75    3.96
               0.833    9.77 | 1.833   17.18 | 2.833    6.21 |  3.83    3.96
               0.917   15.10 | 1.917   13.06 | 2.917    5.65 |  3.92    3.74
               1.000   15.10 | 2.000   13.06 | 3.000    5.65 |  4.00    3.74

     Max.Eff.Inten.(mm/hr)=     203.31       236.34
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.80 (ii)    5.80 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02          0.034 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      77.03        65.54          69.51
     TOTAL RAINFALL   (mm)=      78.03        78.03          78.03
     RUNOFF COEFFICIENT   =       0.99         0.84           0.89

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  94.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.20   0.078     1.85    45.04
      + ID2= 2 (  0011):     0.75   0.114     1.45    64.80
        ====================================================
        ID = 3 (  0004):     2.95   0.183     1.55    50.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):     2.95   0.183     1.55    50.06
      + ID2= 2 (  0027):    16.11   0.410     2.50    22.34
        ====================================================
        ID = 1 (  0004):    19.06   0.517     2.35    26.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    19.06   0.517     2.35    26.63
      + ID2= 2 (  0003):     4.63   0.022     4.08    31.35
        ================================================
        ID = 3 (  0004):    23.69   0.537     2.35    27.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):    23.69   0.537     2.35    27.55
      + ID2= 2 (  0039):     0.08   0.034     1.33    69.51
        ================================================
        ID = 1 (  0004):    23.77   0.539     2.35    27.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    23.77   0.539     2.35    27.69
      + ID2= 2 (  0009):     2.02   0.448     1.40    44.89
        ================================================
        ID = 3 (  0004):    25.79   0.684     1.40    29.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  **********************************************
  ** SIMULATION : Run 07                       **
  **********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\pcallaghan\AppD
|                  |              ata\Local\Temp\
|                  |              d1c59b48-457d-442d-8825-8b87b5d6c641\41490e84
| Ptotal= 44.51 mm |    Comments: 2-Year 12-Hour SCS II Design Storm
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    1.11 |  3.25    1.78 |  6.25    8.01 |  9.25    1.56
                0.50    1.11 |  3.50    1.78 |  6.50    8.01 |  9.50    1.56
                0.75    1.11 |  3.75    1.78 |  6.75    3.56 |  9.75    1.56
                1.00    1.11 |  4.00    1.78 |  7.00    3.56 | 10.00    1.56
                1.25    1.11 |  4.25    2.67 |  7.25    2.67 | 10.25    0.89
                1.50    1.11 |  4.50    2.67 |  7.50    2.67 | 10.50    0.89
                1.75    1.11 |  4.75    3.56 |  7.75    2.67 | 10.75    0.89
                2.00    1.11 |  5.00    3.56 |  8.00    2.67 | 11.00    0.89
                2.25    1.34 |  5.25    5.34 |  8.25    1.56 | 11.25    0.89
                2.50    1.34 |  5.50    5.34 |  8.50    1.56 | 11.50    0.89
                2.75    1.34 |  5.75   21.36 |  8.75    1.56 | 11.75    0.89
                3.00    1.34 |  6.00   58.75 |  9.00    1.56 | 12.00    0.89

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

--------------------
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

         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    1.11 | 3.017    1.78 | 6.017    8.01 |  9.02    1.56
               0.033    1.11 | 3.033    1.78 | 6.033    8.01 |  9.03    1.56
               0.050    1.11 | 3.050    1.78 | 6.050    8.01 |  9.05    1.56
               0.067    1.11 | 3.067    1.78 | 6.067    8.01 |  9.07    1.56
               0.083    1.11 | 3.083    1.78 | 6.083    8.01 |  9.08    1.56
               0.100    1.11 | 3.100    1.78 | 6.100    8.01 |  9.10    1.56
               0.117    1.11 | 3.117    1.78 | 6.117    8.01 |  9.12    1.56
```

0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56
0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56
0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56
0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56
0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89
1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89

1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89
1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89
2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89
2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89
2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89
2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89
2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89

2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 9.482
TOTAL RAINFALL (mm)= 44.510
RUNOFF COEFFICIENT = 0.213

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

CALIB
STANDHYD (0001)
ID= 1 DT= 1.0 min

Area (ha)= 2.91
Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	1.11	3.017	1.78	6.017	8.01	9.02	1.56
0.033	1.11	3.033	1.78	6.033	8.01	9.03	1.56
0.050	1.11	3.050	1.78	6.050	8.01	9.05	1.56
0.067	1.11	3.067	1.78	6.067	8.01	9.07	1.56
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.100	1.11	3.100	1.78	6.100	8.01	9.10	1.56
0.117	1.11	3.117	1.78	6.117	8.01	9.12	1.56
0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56
0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56

0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56
0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56
0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56
0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89
1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89
1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89

1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89
2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89
2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89
2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89
2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89
2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89
2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Max.Eff.Inten.(mm/hr)=	58.75	9.80	
over (min)	5.00	11.00	
Storage Coeff. (min)=	3.41 (ii)	10.70 (ii)	
Unit Hyd. Tpeak (min)=	5.00	11.00	
Unit Hyd. peak (cms)=	0.29	0.10	
			TOTALS
PEAK FLOW (cms)=	0.24	0.02	0.257 (iii)
TIME TO PEAK (hrs)=	6.00	6.10	6.00
RUNOFF VOLUME (mm)=	43.51	5.39	24.83
TOTAL RAINFALL (mm)=	44.51	44.51	44.51
RUNOFF COEFFICIENT =	0.98	0.12	0.56

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0028)	Area (ha)= 0.29
ID= 1 DT= 1.0 min	Total Imp(%)= 67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	1.11	3.017	1.78	6.017	8.01	9.02	1.56
0.033	1.11	3.033	1.78	6.033	8.01	9.03	1.56
0.050	1.11	3.050	1.78	6.050	8.01	9.05	1.56
0.067	1.11	3.067	1.78	6.067	8.01	9.07	1.56
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.100	1.11	3.100	1.78	6.100	8.01	9.10	1.56
0.117	1.11	3.117	1.78	6.117	8.01	9.12	1.56
0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56
0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56
0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56

0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56
0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89
1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89
1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89
1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89
2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89

2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89
2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89
2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89
2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89
2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Max.Eff.Inten.(mm/hr)=	58.75	7.83		
over (min)	5.00	9.00		
Storage Coeff. (min)=	1.93 (ii)	8.51 (ii)		
Unit Hyd. Tpeak (min)=	5.00	9.00		
Unit Hyd. peak (cms)=	0.38	0.13		
			TOTALS	
PEAK FLOW (cms)=	0.03	0.00	0.033 (iii)	
TIME TO PEAK (hrs)=	6.00	6.07	6.00	
RUNOFF VOLUME (mm)=	43.51	4.79	30.72	
TOTAL RAINFALL (mm)=	44.51	44.51	44.51	
RUNOFF COEFFICIENT =	0.98	0.11	0.69	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0016)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):		2.91	0.257	6.00	24.83
+ ID2= 2 (0025):		1.43	0.027	6.25	9.48
ID = 3 (0016):		4.34	0.271	6.00	19.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0016)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0016):		4.34	0.271	6.00	19.77
+ ID2= 2 (0028):		0.29	0.033	6.00	30.72
ID = 1 (0016):		4.63	0.304	6.00	20.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0003)	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	0.0130	0.0895
	0.0000	0.0291	0.0210	0.1555
	0.0010	0.0332	0.0230	0.1780
	0.0040	0.0496	0.0280	0.2176
	0.0050	0.0537	0.0300	0.2309

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0016)	4.630	0.304	6.00	20.46
OUTFLOW: ID= 1 (0003)	4.630	0.010	10.07	12.11

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.29
TIME SHIFT OF PEAK FLOW (min)=244.00
MAXIMUM STORAGE USED (ha.m.)= 0.0762

CALIB			
NASHYD (0026)	Area (ha)= 0.27	Curve Number (CN)= 71.0	
ID= 1 DT= 1.0 min	Ia (mm)= 3.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.02		

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	1.11	3.017	1.78	6.017	8.01	9.02	1.56
0.033	1.11	3.033	1.78	6.033	8.01	9.03	1.56
0.050	1.11	3.050	1.78	6.050	8.01	9.05	1.56
0.067	1.11	3.067	1.78	6.067	8.01	9.07	1.56
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.100	1.11	3.100	1.78	6.100	8.01	9.10	1.56
0.117	1.11	3.117	1.78	6.117	8.01	9.12	1.56
0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56

0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56
0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56
0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56
0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89
1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89
1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89

1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89
1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89
2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89
2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89
2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89
2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89
2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89
2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.016 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 11.554
TOTAL RAINFALL (mm)= 44.510
RUNOFF COEFFICIENT = 0.260

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

CALIB	Area (ha)= 1.75
STANDHYD (0007)	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00
ID= 1 DT= 1.0 min	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	1.11	3.017	1.78	6.017	8.01	9.02	1.56
0.033	1.11	3.033	1.78	6.033	8.01	9.03	1.56
0.050	1.11	3.050	1.78	6.050	8.01	9.05	1.56
0.067	1.11	3.067	1.78	6.067	8.01	9.07	1.56
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.100	1.11	3.100	1.78	6.100	8.01	9.10	1.56
0.117	1.11	3.117	1.78	6.117	8.01	9.12	1.56
0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56
0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56
0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56
0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56

0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89
1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89
1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89
1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89
2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89
2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89

2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89
2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89
2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89
2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Max.Eff.Inten.(mm/hr)=	58.75	10.78		
over (min)	5.00	12.00		
Storage Coeff. (min)=	3.31 (ii)	11.39 (ii)		
Unit Hyd. Tpeak (min)=	5.00	12.00		
Unit Hyd. peak (cms)=	0.29	0.10		
			TOTALS	
PEAK FLOW (cms)=	0.14	0.01	0.154 (iii)	
TIME TO PEAK (hrs)=	6.00	6.12	6.00	
RUNOFF VOLUME (mm)=	43.51	5.66	24.96	
TOTAL RAINFALL (mm)=	44.51	44.51	44.51	
RUNOFF COEFFICIENT =	0.98	0.13	0.56	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0018) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0026):	0.27	0.016	6.00	11.55
+ ID2= 2 (0007):	1.75	0.154	6.00	24.96
ID = 3 (0018):	2.02	0.170	6.00	23.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0009) IN= 2---> OUT= 1	OVERFLOW IS OFF

DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0007	0.0212	0.0291
	0.0037	0.0045	0.0402	0.0316
	0.0053	0.0065	0.1203	0.0341
	0.0081	0.0128	0.2476	0.0366
	0.0101	0.0188	0.3901	0.0373
	0.0118	0.0250	0.4841	0.0381
	0.0126	0.0279	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	2.020	0.170	6.00	23.17
OUTFLOW: ID= 1 (0009)	2.020	0.016	6.63	22.69

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.57
TIME SHIFT OF PEAK FLOW (min)= 38.00
MAXIMUM STORAGE USED (ha.m.)= 0.0284

CALIB			
NASHYD (0027)	Area (ha)= 16.11	Curve Number (CN)= 61.0	
ID= 1 DT= 1.0 min	Ia (mm)= 5.60	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.95		

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	1.11	3.017	1.78	6.017	8.01	9.02	1.56
0.033	1.11	3.033	1.78	6.033	8.01	9.03	1.56
0.050	1.11	3.050	1.78	6.050	8.01	9.05	1.56
0.067	1.11	3.067	1.78	6.067	8.01	9.07	1.56
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.100	1.11	3.100	1.78	6.100	8.01	9.10	1.56
0.117	1.11	3.117	1.78	6.117	8.01	9.12	1.56
0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56
0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56

0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56
0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56
0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89
1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89
1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89
1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89

2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89
2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89
2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89
2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89
2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89
2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.112 (i)
TIME TO PEAK (hrs)= 7.017
RUNOFF VOLUME (mm)= 7.520
TOTAL RAINFALL (mm)= 44.510
RUNOFF COEFFICIENT = 0.169

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

CALIB	
STANDHYD (0006)	Area (ha)= 0.75
ID= 1 DT= 1.0 min	Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	1.11	3.017	1.78	6.017	8.01	9.02	1.56
0.033	1.11	3.033	1.78	6.033	8.01	9.03	1.56
0.050	1.11	3.050	1.78	6.050	8.01	9.05	1.56
0.067	1.11	3.067	1.78	6.067	8.01	9.07	1.56
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.100	1.11	3.100	1.78	6.100	8.01	9.10	1.56
0.117	1.11	3.117	1.78	6.117	8.01	9.12	1.56
0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56
0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56
0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56
0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56
0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89
1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89

1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89
1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89
1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89
2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89
2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89
2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89
2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89

2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89
2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Max.Eff.Inten.(mm/hr)=	58.75	50.14		
over (min)	5.00	7.00		
Storage Coeff. (min)=	2.57 (ii)	6.49 (ii)		
Unit Hyd. Tpeak (min)=	5.00	7.00		
Unit Hyd. peak (cms)=	0.33	0.17		
			TOTALS	
PEAK FLOW (cms)=	0.09	0.01	0.098 (iii)	
TIME TO PEAK (hrs)=	6.00	6.03	6.00	
RUNOFF VOLUME (mm)=	43.51	11.87	35.28	
TOTAL RAINFALL (mm)=	44.51	44.51	44.51	
RUNOFF COEFFICIENT =	0.98	0.27	0.79	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0011)	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	0.0912	0.0179
	0.0006	0.0005	0.1027	0.0204
	0.0062	0.0056	0.1264	0.0248
	0.0100	0.0060	0.1349	0.0263
	0.0470	0.0101	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0006)	0.750	0.098	6.00	35.28
OUTFLOW: ID= 1 (0011)	0.750	0.052	6.08	35.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 52.70
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0110

CALIB		
STANDHYD (0008)	Area (ha)= 2.20	
ID= 1 DT= 1.0 min	Total Imp(%)= 59.00	Dir. Conn.(%)= 45.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.30	0.90
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	121.11	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	1.11	3.017	1.78	6.017	8.01	9.02	1.56
0.033	1.11	3.033	1.78	6.033	8.01	9.03	1.56
0.050	1.11	3.050	1.78	6.050	8.01	9.05	1.56
0.067	1.11	3.067	1.78	6.067	8.01	9.07	1.56
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.100	1.11	3.100	1.78	6.100	8.01	9.10	1.56
0.117	1.11	3.117	1.78	6.117	8.01	9.12	1.56
0.133	1.11	3.133	1.78	6.133	8.01	9.13	1.56
0.150	1.11	3.150	1.78	6.150	8.01	9.15	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.183	1.11	3.183	1.78	6.183	8.01	9.18	1.56
0.200	1.11	3.200	1.78	6.200	8.01	9.20	1.56
0.217	1.11	3.217	1.78	6.217	8.01	9.22	1.56
0.233	1.11	3.233	1.78	6.233	8.01	9.23	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.267	1.11	3.267	1.78	6.267	8.01	9.27	1.56
0.283	1.11	3.283	1.78	6.283	8.01	9.28	1.56
0.300	1.11	3.300	1.78	6.300	8.01	9.30	1.56
0.317	1.11	3.317	1.78	6.317	8.01	9.32	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.350	1.11	3.350	1.78	6.350	8.01	9.35	1.56
0.367	1.11	3.367	1.78	6.367	8.01	9.37	1.56
0.383	1.11	3.383	1.78	6.383	8.01	9.38	1.56
0.400	1.11	3.400	1.78	6.400	8.01	9.40	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.433	1.11	3.433	1.78	6.433	8.01	9.43	1.56
0.450	1.11	3.450	1.78	6.450	8.01	9.45	1.56
0.467	1.11	3.467	1.78	6.467	8.01	9.47	1.56
0.483	1.11	3.483	1.78	6.483	8.01	9.48	1.56
0.500	1.11	3.500	1.78	6.500	8.00	9.50	1.56
0.517	1.11	3.517	1.78	6.517	3.56	9.52	1.56
0.533	1.11	3.533	1.78	6.533	3.56	9.53	1.56
0.550	1.11	3.550	1.78	6.550	3.56	9.55	1.56
0.567	1.11	3.567	1.78	6.567	3.56	9.57	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.600	1.11	3.600	1.78	6.600	3.56	9.60	1.56
0.617	1.11	3.617	1.78	6.617	3.56	9.62	1.56
0.633	1.11	3.633	1.78	6.633	3.56	9.63	1.56
0.650	1.11	3.650	1.78	6.650	3.56	9.65	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.683	1.11	3.683	1.78	6.683	3.56	9.68	1.56
0.700	1.11	3.700	1.78	6.700	3.56	9.70	1.56
0.717	1.11	3.717	1.78	6.717	3.56	9.72	1.56
0.733	1.11	3.733	1.78	6.733	3.56	9.73	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.767	1.11	3.767	1.78	6.767	3.56	9.77	1.56
0.783	1.11	3.783	1.78	6.783	3.56	9.78	1.56
0.800	1.11	3.800	1.78	6.800	3.56	9.80	1.56
0.817	1.11	3.817	1.78	6.817	3.56	9.82	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.850	1.11	3.850	1.78	6.850	3.56	9.85	1.56
0.867	1.11	3.867	1.78	6.867	3.56	9.87	1.56
0.883	1.11	3.883	1.78	6.883	3.56	9.88	1.56
0.900	1.11	3.900	1.78	6.900	3.56	9.90	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
0.933	1.11	3.933	1.78	6.933	3.56	9.93	1.56
0.950	1.11	3.950	1.78	6.950	3.56	9.95	1.56
0.967	1.11	3.967	1.78	6.967	3.56	9.97	1.56
0.983	1.11	3.983	1.78	6.983	3.56	9.98	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.017	1.11	4.017	2.67	7.017	2.67	10.02	0.89
1.033	1.11	4.033	2.67	7.033	2.67	10.03	0.89
1.050	1.11	4.050	2.67	7.050	2.67	10.05	0.89
1.067	1.11	4.067	2.67	7.067	2.67	10.07	0.89
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.100	1.11	4.100	2.67	7.100	2.67	10.10	0.89
1.117	1.11	4.117	2.67	7.117	2.67	10.12	0.89
1.133	1.11	4.133	2.67	7.133	2.67	10.13	0.89
1.150	1.11	4.150	2.67	7.150	2.67	10.15	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.183	1.11	4.183	2.67	7.183	2.67	10.18	0.89

1.200	1.11	4.200	2.67	7.200	2.67	10.20	0.89
1.217	1.11	4.217	2.67	7.217	2.67	10.22	0.89
1.233	1.11	4.233	2.67	7.233	2.67	10.23	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.267	1.11	4.267	2.67	7.267	2.67	10.27	0.89
1.283	1.11	4.283	2.67	7.283	2.67	10.28	0.89
1.300	1.11	4.300	2.67	7.300	2.67	10.30	0.89
1.317	1.11	4.317	2.67	7.317	2.67	10.32	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.350	1.11	4.350	2.67	7.350	2.67	10.35	0.89
1.367	1.11	4.367	2.67	7.367	2.67	10.37	0.89
1.383	1.11	4.383	2.67	7.383	2.67	10.38	0.89
1.400	1.11	4.400	2.67	7.400	2.67	10.40	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.433	1.11	4.433	2.67	7.433	2.67	10.43	0.89
1.450	1.11	4.450	2.67	7.450	2.67	10.45	0.89
1.467	1.11	4.467	2.67	7.467	2.67	10.47	0.89
1.483	1.11	4.483	2.67	7.483	2.67	10.48	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.517	1.11	4.517	3.56	7.517	2.67	10.52	0.89
1.533	1.11	4.533	3.56	7.533	2.67	10.53	0.89
1.550	1.11	4.550	3.56	7.550	2.67	10.55	0.89
1.567	1.11	4.567	3.56	7.567	2.67	10.57	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.600	1.11	4.600	3.56	7.600	2.67	10.60	0.89
1.617	1.11	4.617	3.56	7.617	2.67	10.62	0.89
1.633	1.11	4.633	3.56	7.633	2.67	10.63	0.89
1.650	1.11	4.650	3.56	7.650	2.67	10.65	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.683	1.11	4.683	3.56	7.683	2.67	10.68	0.89
1.700	1.11	4.700	3.56	7.700	2.67	10.70	0.89
1.717	1.11	4.717	3.56	7.717	2.67	10.72	0.89
1.733	1.11	4.733	3.56	7.733	2.67	10.73	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.767	1.11	4.767	3.56	7.767	2.67	10.77	0.89
1.783	1.11	4.783	3.56	7.783	2.67	10.78	0.89
1.800	1.11	4.800	3.56	7.800	2.67	10.80	0.89
1.817	1.11	4.817	3.56	7.817	2.67	10.82	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.850	1.11	4.850	3.56	7.850	2.67	10.85	0.89
1.867	1.11	4.867	3.56	7.867	2.67	10.87	0.89
1.883	1.11	4.883	3.56	7.883	2.67	10.88	0.89
1.900	1.11	4.900	3.56	7.900	2.67	10.90	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
1.933	1.11	4.933	3.56	7.933	2.67	10.93	0.89
1.950	1.11	4.950	3.56	7.950	2.67	10.95	0.89
1.967	1.11	4.967	3.56	7.967	2.67	10.97	0.89
1.983	1.11	4.983	3.56	7.983	2.67	10.98	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.017	1.34	5.017	5.34	8.017	1.56	11.02	0.89
2.033	1.34	5.033	5.34	8.033	1.56	11.03	0.89
2.050	1.34	5.050	5.34	8.050	1.56	11.05	0.89
2.067	1.34	5.067	5.34	8.067	1.56	11.07	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.100	1.34	5.100	5.34	8.100	1.56	11.10	0.89
2.117	1.34	5.117	5.34	8.117	1.56	11.12	0.89
2.133	1.34	5.133	5.34	8.133	1.56	11.13	0.89
2.150	1.34	5.150	5.34	8.150	1.56	11.15	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.183	1.34	5.183	5.34	8.183	1.56	11.18	0.89
2.200	1.34	5.200	5.34	8.200	1.56	11.20	0.89
2.217	1.34	5.217	5.34	8.217	1.56	11.22	0.89
2.233	1.34	5.233	5.34	8.233	1.56	11.23	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.267	1.34	5.267	5.34	8.267	1.56	11.27	0.89
2.283	1.34	5.283	5.34	8.283	1.56	11.28	0.89
2.300	1.34	5.300	5.34	8.300	1.56	11.30	0.89
2.317	1.34	5.317	5.34	8.317	1.56	11.32	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.350	1.34	5.350	5.34	8.350	1.56	11.35	0.89
2.367	1.34	5.367	5.34	8.367	1.56	11.37	0.89
2.383	1.34	5.383	5.34	8.383	1.56	11.38	0.89
2.400	1.34	5.400	5.34	8.400	1.56	11.40	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.433	1.34	5.433	5.34	8.433	1.56	11.43	0.89
2.450	1.34	5.450	5.34	8.450	1.56	11.45	0.89
2.467	1.34	5.467	5.34	8.467	1.56	11.47	0.89
2.483	1.34	5.483	5.34	8.483	1.56	11.48	0.89
2.500	1.34	5.500	5.36	8.500	1.56	11.50	0.89

2.517	1.34	5.517	21.36	8.517	1.56	11.52	0.89
2.533	1.34	5.533	21.36	8.533	1.56	11.53	0.89
2.550	1.34	5.550	21.36	8.550	1.56	11.55	0.89
2.567	1.34	5.567	21.36	8.567	1.56	11.57	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.600	1.34	5.600	21.36	8.600	1.56	11.60	0.89
2.617	1.34	5.617	21.36	8.617	1.56	11.62	0.89
2.633	1.34	5.633	21.36	8.633	1.56	11.63	0.89
2.650	1.34	5.650	21.36	8.650	1.56	11.65	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.683	1.34	5.683	21.36	8.683	1.56	11.68	0.89
2.700	1.34	5.700	21.36	8.700	1.56	11.70	0.89
2.717	1.34	5.717	21.36	8.717	1.56	11.72	0.89
2.733	1.34	5.733	21.36	8.733	1.56	11.73	0.89
2.750	1.34	5.750	21.41	8.750	1.56	11.75	0.89
2.767	1.34	5.767	58.75	8.767	1.56	11.77	0.89
2.783	1.34	5.783	58.75	8.783	1.56	11.78	0.89
2.800	1.34	5.800	58.75	8.800	1.56	11.80	0.89
2.817	1.34	5.817	58.75	8.817	1.56	11.82	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.850	1.34	5.850	58.75	8.850	1.56	11.85	0.89
2.867	1.34	5.867	58.75	8.867	1.56	11.87	0.89
2.883	1.34	5.883	58.75	8.883	1.56	11.88	0.89
2.900	1.34	5.900	58.75	8.900	1.56	11.90	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
2.933	1.34	5.933	58.75	8.933	1.56	11.93	0.89
2.950	1.34	5.950	58.75	8.950	1.56	11.95	0.89
2.967	1.34	5.967	58.75	8.967	1.56	11.97	0.89
2.983	1.34	5.983	58.75	8.983	1.56	11.98	0.89
3.000	1.34	6.000	58.68	9.000	1.56	12.00	0.89

Max.Eff.Inten.(mm/hr)=	58.75	14.30	
over (min)	5.00	12.00	
Storage Coeff. (min)=	3.55 (ii)	11.96 (ii)	
Unit Hyd. Tpeak (min)=	5.00	12.00	
Unit Hyd. peak (cms)=	0.28	0.09	
			TOTALS
PEAK FLOW (cms)=	0.16	0.02	0.176 (iii)
TIME TO PEAK (hrs)=	6.00	6.12	6.00
RUNOFF VOLUME (mm)=	43.51	6.54	23.17
TOTAL RAINFALL (mm)=	44.51	44.51	44.51
RUNOFF COEFFICIENT =	0.98	0.15	0.52

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010) | IN= 2---> OUT= 1 | DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0570	0.0442
	0.0008	0.0012	0.0640	0.0503
	0.0063	0.0138	0.0780	0.0611
	0.0090	0.0149	0.0830	0.0649
	0.0320	0.0249	0.0000	0.0000

OVERFLOW IS OFF

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)	2.200	0.176	6.00	23.17
OUTFLOW: ID= 1 (0010)	2.200	0.035	6.33	23.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.04
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.0274

CALIB | STANDHYD (0039) | ID= 1 DT= 5.0 min	Area (ha)= 0.08 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.04

Dep. Storage (mm)=	1.00	2.30	
Average Slope (%)=	1.00	2.00	
Length (m)=	23.09	40.00	
Mannings n =	0.013	0.250	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.11	3.083	1.78	6.083	8.01	9.08	1.56
0.167	1.11	3.167	1.78	6.167	8.01	9.17	1.56
0.250	1.11	3.250	1.78	6.250	8.01	9.25	1.56
0.333	1.11	3.333	1.78	6.333	8.01	9.33	1.56
0.417	1.11	3.417	1.78	6.417	8.01	9.42	1.56
0.500	1.11	3.500	1.78	6.500	8.01	9.50	1.56
0.583	1.11	3.583	1.78	6.583	3.56	9.58	1.56
0.667	1.11	3.667	1.78	6.667	3.56	9.67	1.56
0.750	1.11	3.750	1.78	6.750	3.56	9.75	1.56
0.833	1.11	3.833	1.78	6.833	3.56	9.83	1.56
0.917	1.11	3.917	1.78	6.917	3.56	9.92	1.56
1.000	1.11	4.000	1.78	7.000	3.56	10.00	1.56
1.083	1.11	4.083	2.67	7.083	2.67	10.08	0.89
1.167	1.11	4.167	2.67	7.167	2.67	10.17	0.89
1.250	1.11	4.250	2.67	7.250	2.67	10.25	0.89
1.333	1.11	4.333	2.67	7.333	2.67	10.33	0.89
1.417	1.11	4.417	2.67	7.417	2.67	10.42	0.89
1.500	1.11	4.500	2.67	7.500	2.67	10.50	0.89
1.583	1.11	4.583	3.56	7.583	2.67	10.58	0.89
1.667	1.11	4.667	3.56	7.667	2.67	10.67	0.89
1.750	1.11	4.750	3.56	7.750	2.67	10.75	0.89
1.833	1.11	4.833	3.56	7.833	2.67	10.83	0.89
1.917	1.11	4.917	3.56	7.917	2.67	10.92	0.89
2.000	1.11	5.000	3.56	8.000	2.67	11.00	0.89
2.083	1.34	5.083	5.34	8.083	1.56	11.08	0.89
2.167	1.34	5.167	5.34	8.167	1.56	11.17	0.89
2.250	1.34	5.250	5.34	8.250	1.56	11.25	0.89
2.333	1.34	5.333	5.34	8.333	1.56	11.33	0.89
2.417	1.34	5.417	5.34	8.417	1.56	11.42	0.89
2.500	1.34	5.500	5.34	8.500	1.56	11.50	0.89
2.583	1.34	5.583	21.36	8.583	1.56	11.58	0.89
2.667	1.34	5.667	21.36	8.667	1.56	11.67	0.89
2.750	1.34	5.750	21.37	8.750	1.56	11.75	0.89
2.833	1.34	5.833	58.75	8.833	1.56	11.83	0.89
2.917	1.34	5.917	58.75	8.917	1.56	11.92	0.89
3.000	1.34	6.000	58.75	9.000	1.56	12.00	0.89

Max.Eff.Inten.(mm/hr)=	58.75	67.53	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.31 (ii)	9.57 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.33	0.11	
			TOTALS
PEAK FLOW (cms)=	0.00	0.01	0.010 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	43.51	33.09	36.68
TOTAL RAINFALL (mm)=	44.51	44.51	44.51
RUNOFF COEFFICIENT =	0.98	0.74	0.82

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 94.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0004)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	2.20	0.035	6.33	23.00
+ ID2= 2 (0011):	0.75	0.052	6.08	35.00
ID = 3 (0004):	2.95	0.085	6.10	26.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 3 (0004):	2.95	0.085	6.10	26.05	
+ ID2= 2 (0027):	16.11	0.112	7.02	7.52	
ID = 1 (0004):	19.06	0.156	6.83	10.39	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	19.06	0.156	6.83	10.39
+ ID2= 2 (0003):	4.63	0.010	10.07	12.11
ID = 3 (0004):	23.69	0.165	6.85	10.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0004):	23.69	0.165	6.85	10.73
+ ID2= 2 (0039):	0.08	0.010	6.00	36.68
ID = 1 (0004):	23.77	0.166	6.83	10.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	23.77	0.166	6.83	10.81
+ ID2= 2 (0009):	2.02	0.016	6.63	22.69
ID = 3 (0004):	25.79	0.181	6.78	11.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION : Run 08 **
****

READ STORM	Filename: C:\Users\pcallaghan\AppData\Local\Temp\d1c59b48-457d-442d-8825-8b87b5d6c641\751c12f9
Ptotal= 58.27 mm	Comments: 5-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.46	3.25	2.33	6.25	10.49	9.25	2.04
0.50	1.46	3.50	2.33	6.50	10.49	9.50	2.04
0.75	1.46	3.75	2.33	6.75	4.66	9.75	2.04
1.00	1.46	4.00	2.33	7.00	4.66	10.00	2.04
1.25	1.46	4.25	3.50	7.25	3.50	10.25	1.17
1.50	1.46	4.50	3.50	7.50	3.50	10.50	1.17
1.75	1.46	4.75	4.66	7.75	3.50	10.75	1.17
2.00	1.46	5.00	4.66	8.00	3.50	11.00	1.17
2.25	1.75	5.25	6.99	8.25	2.04	11.25	1.17
2.50	1.75	5.50	6.99	8.50	2.04	11.50	1.17
2.75	1.75	5.75	27.97	8.75	2.04	11.75	1.17
3.00	1.75	6.00	76.92	9.00	2.04	12.00	1.17

```
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

        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	1.46	3.017	2.33	6.017	10.49	9.02	2.04
0.033	1.46	3.033	2.33	6.033	10.49	9.03	2.04
0.050	1.46	3.050	2.33	6.050	10.49	9.05	2.04
0.067	1.46	3.067	2.33	6.067	10.49	9.07	2.04
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.100	1.46	3.100	2.33	6.100	10.49	9.10	2.04
0.117	1.46	3.117	2.33	6.117	10.49	9.12	2.04
0.133	1.46	3.133	2.33	6.133	10.49	9.13	2.04
0.150	1.46	3.150	2.33	6.150	10.49	9.15	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.183	1.46	3.183	2.33	6.183	10.49	9.18	2.04
0.200	1.46	3.200	2.33	6.200	10.49	9.20	2.04
0.217	1.46	3.217	2.33	6.217	10.49	9.22	2.04
0.233	1.46	3.233	2.33	6.233	10.49	9.23	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.267	1.46	3.267	2.33	6.267	10.49	9.27	2.04
0.283	1.46	3.283	2.33	6.283	10.49	9.28	2.04
0.300	1.46	3.300	2.33	6.300	10.49	9.30	2.04
0.317	1.46	3.317	2.33	6.317	10.49	9.32	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.350	1.46	3.350	2.33	6.350	10.49	9.35	2.04
0.367	1.46	3.367	2.33	6.367	10.49	9.37	2.04
0.383	1.46	3.383	2.33	6.383	10.49	9.38	2.04
0.400	1.46	3.400	2.33	6.400	10.49	9.40	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.433	1.46	3.433	2.33	6.433	10.49	9.43	2.04
0.450	1.46	3.450	2.33	6.450	10.49	9.45	2.04
0.467	1.46	3.467	2.33	6.467	10.49	9.47	2.04
0.483	1.46	3.483	2.33	6.483	10.49	9.48	2.04
0.500	1.46	3.500	2.33	6.500	10.48	9.50	2.04
0.517	1.46	3.517	2.33	6.517	4.66	9.52	2.04
0.533	1.46	3.533	2.33	6.533	4.66	9.53	2.04
0.550	1.46	3.550	2.33	6.550	4.66	9.55	2.04
0.567	1.46	3.567	2.33	6.567	4.66	9.57	2.04
0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.600	1.46	3.600	2.33	6.600	4.66	9.60	2.04
0.617	1.46	3.617	2.33	6.617	4.66	9.62	2.04
0.633	1.46	3.633	2.33	6.633	4.66	9.63	2.04
0.650	1.46	3.650	2.33	6.650	4.66	9.65	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.683	1.46	3.683	2.33	6.683	4.66	9.68	2.04
0.700	1.46	3.700	2.33	6.700	4.66	9.70	2.04
0.717	1.46	3.717	2.33	6.717	4.66	9.72	2.04
0.733	1.46	3.733	2.33	6.733	4.66	9.73	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.767	1.46	3.767	2.33	6.767	4.66	9.77	2.04
0.783	1.46	3.783	2.33	6.783	4.66	9.78	2.04
0.800	1.46	3.800	2.33	6.800	4.66	9.80	2.04
0.817	1.46	3.817	2.33	6.817	4.66	9.82	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.850	1.46	3.850	2.33	6.850	4.66	9.85	2.04
0.867	1.46	3.867	2.33	6.867	4.66	9.87	2.04
0.883	1.46	3.883	2.33	6.883	4.66	9.88	2.04
0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04
0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17

1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17
1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17
1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17
1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17
2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17
2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17

2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17
2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.045 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 15.908
TOTAL RAINFALL (mm)= 58.270
RUNOFF COEFFICIENT = 0.273

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

CALIB	
STANDHYD (0001)	Area (ha)= 2.91
ID= 1 DT= 1.0 min	Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	1.46	3.017	2.33	6.017	10.49	9.02	2.04
0.033	1.46	3.033	2.33	6.033	10.49	9.03	2.04
0.050	1.46	3.050	2.33	6.050	10.49	9.05	2.04
0.067	1.46	3.067	2.33	6.067	10.49	9.07	2.04
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.100	1.46	3.100	2.33	6.100	10.49	9.10	2.04
0.117	1.46	3.117	2.33	6.117	10.49	9.12	2.04
0.133	1.46	3.133	2.33	6.133	10.49	9.13	2.04
0.150	1.46	3.150	2.33	6.150	10.49	9.15	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.183	1.46	3.183	2.33	6.183	10.49	9.18	2.04
0.200	1.46	3.200	2.33	6.200	10.49	9.20	2.04
0.217	1.46	3.217	2.33	6.217	10.49	9.22	2.04
0.233	1.46	3.233	2.33	6.233	10.49	9.23	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.267	1.46	3.267	2.33	6.267	10.49	9.27	2.04

0.283	1.46	3.283	2.33	6.283	10.49	9.28	2.04
0.300	1.46	3.300	2.33	6.300	10.49	9.30	2.04
0.317	1.46	3.317	2.33	6.317	10.49	9.32	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.350	1.46	3.350	2.33	6.350	10.49	9.35	2.04
0.367	1.46	3.367	2.33	6.367	10.49	9.37	2.04
0.383	1.46	3.383	2.33	6.383	10.49	9.38	2.04
0.400	1.46	3.400	2.33	6.400	10.49	9.40	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.433	1.46	3.433	2.33	6.433	10.49	9.43	2.04
0.450	1.46	3.450	2.33	6.450	10.49	9.45	2.04
0.467	1.46	3.467	2.33	6.467	10.49	9.47	2.04
0.483	1.46	3.483	2.33	6.483	10.49	9.48	2.04
0.500	1.46	3.500	2.33	6.500	10.48	9.50	2.04
0.517	1.46	3.517	2.33	6.517	4.66	9.52	2.04
0.533	1.46	3.533	2.33	6.533	4.66	9.53	2.04
0.550	1.46	3.550	2.33	6.550	4.66	9.55	2.04
0.567	1.46	3.567	2.33	6.567	4.66	9.57	2.04
0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.600	1.46	3.600	2.33	6.600	4.66	9.60	2.04
0.617	1.46	3.617	2.33	6.617	4.66	9.62	2.04
0.633	1.46	3.633	2.33	6.633	4.66	9.63	2.04
0.650	1.46	3.650	2.33	6.650	4.66	9.65	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.683	1.46	3.683	2.33	6.683	4.66	9.68	2.04
0.700	1.46	3.700	2.33	6.700	4.66	9.70	2.04
0.717	1.46	3.717	2.33	6.717	4.66	9.72	2.04
0.733	1.46	3.733	2.33	6.733	4.66	9.73	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.767	1.46	3.767	2.33	6.767	4.66	9.77	2.04
0.783	1.46	3.783	2.33	6.783	4.66	9.78	2.04
0.800	1.46	3.800	2.33	6.800	4.66	9.80	2.04
0.817	1.46	3.817	2.33	6.817	4.66	9.82	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.850	1.46	3.850	2.33	6.850	4.66	9.85	2.04
0.867	1.46	3.867	2.33	6.867	4.66	9.87	2.04
0.883	1.46	3.883	2.33	6.883	4.66	9.88	2.04
0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04
0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17
1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17
1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17

1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17
1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17
1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17
2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17
2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17
2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17
2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17

2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Max.Eff.Inten.(mm/hr)=	76.92	16.87	
over (min)	5.00	10.00	
Storage Coeff. (min)=	3.07 (ii)	9.61 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.30	0.12	
			TOTALS
PEAK FLOW (cms)=	0.31	0.04	0.349 (iii)
TIME TO PEAK (hrs)=	6.00	6.08	6.00
RUNOFF VOLUME (mm)=	57.27	9.30	33.76
TOTAL RAINFALL (mm)=	58.27	58.27	58.27
RUNOFF COEFFICIENT =	0.98	0.16	0.58

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0028)	Area (ha)= 0.29
ID= 1 DT= 1.0 min	Total Imp(%)= 67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	1.46	3.017	2.33	6.017	10.49	9.02	2.04
0.033	1.46	3.033	2.33	6.033	10.49	9.03	2.04
0.050	1.46	3.050	2.33	6.050	10.49	9.05	2.04
0.067	1.46	3.067	2.33	6.067	10.49	9.07	2.04
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.100	1.46	3.100	2.33	6.100	10.49	9.10	2.04
0.117	1.46	3.117	2.33	6.117	10.49	9.12	2.04
0.133	1.46	3.133	2.33	6.133	10.49	9.13	2.04
0.150	1.46	3.150	2.33	6.150	10.49	9.15	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.183	1.46	3.183	2.33	6.183	10.49	9.18	2.04
0.200	1.46	3.200	2.33	6.200	10.49	9.20	2.04
0.217	1.46	3.217	2.33	6.217	10.49	9.22	2.04
0.233	1.46	3.233	2.33	6.233	10.49	9.23	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.267	1.46	3.267	2.33	6.267	10.49	9.27	2.04
0.283	1.46	3.283	2.33	6.283	10.49	9.28	2.04
0.300	1.46	3.300	2.33	6.300	10.49	9.30	2.04
0.317	1.46	3.317	2.33	6.317	10.49	9.32	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.350	1.46	3.350	2.33	6.350	10.49	9.35	2.04
0.367	1.46	3.367	2.33	6.367	10.49	9.37	2.04
0.383	1.46	3.383	2.33	6.383	10.49	9.38	2.04
0.400	1.46	3.400	2.33	6.400	10.49	9.40	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.433	1.46	3.433	2.33	6.433	10.49	9.43	2.04
0.450	1.46	3.450	2.33	6.450	10.49	9.45	2.04
0.467	1.46	3.467	2.33	6.467	10.49	9.47	2.04
0.483	1.46	3.483	2.33	6.483	10.49	9.48	2.04
0.500	1.46	3.500	2.33	6.500	10.48	9.50	2.04
0.517	1.46	3.517	2.33	6.517	4.66	9.52	2.04
0.533	1.46	3.533	2.33	6.533	4.66	9.53	2.04
0.550	1.46	3.550	2.33	6.550	4.66	9.55	2.04
0.567	1.46	3.567	2.33	6.567	4.66	9.57	2.04

0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.600	1.46	3.600	2.33	6.600	4.66	9.60	2.04
0.617	1.46	3.617	2.33	6.617	4.66	9.62	2.04
0.633	1.46	3.633	2.33	6.633	4.66	9.63	2.04
0.650	1.46	3.650	2.33	6.650	4.66	9.65	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.683	1.46	3.683	2.33	6.683	4.66	9.68	2.04
0.700	1.46	3.700	2.33	6.700	4.66	9.70	2.04
0.717	1.46	3.717	2.33	6.717	4.66	9.72	2.04
0.733	1.46	3.733	2.33	6.733	4.66	9.73	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.767	1.46	3.767	2.33	6.767	4.66	9.77	2.04
0.783	1.46	3.783	2.33	6.783	4.66	9.78	2.04
0.800	1.46	3.800	2.33	6.800	4.66	9.80	2.04
0.817	1.46	3.817	2.33	6.817	4.66	9.82	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.850	1.46	3.850	2.33	6.850	4.66	9.85	2.04
0.867	1.46	3.867	2.33	6.867	4.66	9.87	2.04
0.883	1.46	3.883	2.33	6.883	4.66	9.88	2.04
0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04
0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17
1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17
1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17
1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17

1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17
2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17
2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17
2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17
2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Max.Eff.Inten.(mm/hr)=	76.92	13.62	
over (min)	5.00	8.00	
Storage Coeff. (min)=	1.73 (ii)	7.64 (ii)	
Unit Hyd. Tpeak (min)=	5.00	8.00	
Unit Hyd. peak (cms)=	0.40	0.15	
			TOTALS
PEAK FLOW (cms)=	0.04	0.00	0.044 (iii)
TIME TO PEAK (hrs)=	6.00	6.05	6.00
RUNOFF VOLUME (mm)=	57.27	8.35	41.12
TOTAL RAINFALL (mm)=	58.27	58.27	58.27
RUNOFF COEFFICIENT =	0.98	0.14	0.71

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.91   0.349     6.00    33.76
      + ID2= 2 (  0025):     1.43   0.045     6.25    15.91
        ================================================
        ID = 3 (  0016):     4.34   0.375     6.00    27.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.375     6.00    27.88
      + ID2= 2 (  0028):     0.29   0.044     6.00    41.12
        ================================================
        ID = 1 (  0016):     4.63   0.419     6.00    28.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0130      0.0895
                          0.0000     0.0291    |   0.0210      0.1555
                          0.0010     0.0332    |   0.0230      0.1780
                          0.0040     0.0496    |   0.0280      0.2176
                          0.0050     0.0537    |   0.0300      0.2309

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0016)     4.630      0.419      6.00      28.71
   OUTFLOW: ID= 1 (  0003)     4.630      0.015     10.05      19.18

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.54
                  TIME SHIFT OF PEAK FLOW         (min)=243.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1046

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0026)|   Area    (ha)=   0.27   Curve Number   (CN)= 71.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   3.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.02

         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    1.46 | 3.017    2.33 | 6.017   10.49 |  9.02    2.04
               0.033    1.46 | 3.033    2.33 | 6.033   10.49 |  9.03    2.04
               0.050    1.46 | 3.050    2.33 | 6.050   10.49 |  9.05    2.04
               0.067    1.46 | 3.067    2.33 | 6.067   10.49 |  9.07    2.04
               0.083    1.46 | 3.083    2.33 | 6.083   10.49 |  9.08    2.04
               0.100    1.46 | 3.100    2.33 | 6.100   10.49 |  9.10    2.04
               0.117    1.46 | 3.117    2.33 | 6.117   10.49 |  9.12    2.04
               0.133    1.46 | 3.133    2.33 | 6.133   10.49 |  9.13    2.04
               0.150    1.46 | 3.150    2.33 | 6.150   10.49 |  9.15    2.04
               0.167    1.46 | 3.167    2.33 | 6.167   10.49 |  9.17    2.04
               0.183    1.46 | 3.183    2.33 | 6.183   10.49 |  9.18    2.04
               0.200    1.46 | 3.200    2.33 | 6.200   10.49 |  9.20    2.04
               0.217    1.46 | 3.217    2.33 | 6.217   10.49 |  9.22    2.04
```

0.233	1.46	3.233	2.33	6.233	10.49	9.23	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.267	1.46	3.267	2.33	6.267	10.49	9.27	2.04
0.283	1.46	3.283	2.33	6.283	10.49	9.28	2.04
0.300	1.46	3.300	2.33	6.300	10.49	9.30	2.04
0.317	1.46	3.317	2.33	6.317	10.49	9.32	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.350	1.46	3.350	2.33	6.350	10.49	9.35	2.04
0.367	1.46	3.367	2.33	6.367	10.49	9.37	2.04
0.383	1.46	3.383	2.33	6.383	10.49	9.38	2.04
0.400	1.46	3.400	2.33	6.400	10.49	9.40	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.433	1.46	3.433	2.33	6.433	10.49	9.43	2.04
0.450	1.46	3.450	2.33	6.450	10.49	9.45	2.04
0.467	1.46	3.467	2.33	6.467	10.49	9.47	2.04
0.483	1.46	3.483	2.33	6.483	10.49	9.48	2.04
0.500	1.46	3.500	2.33	6.500	10.48	9.50	2.04
0.517	1.46	3.517	2.33	6.517	4.66	9.52	2.04
0.533	1.46	3.533	2.33	6.533	4.66	9.53	2.04
0.550	1.46	3.550	2.33	6.550	4.66	9.55	2.04
0.567	1.46	3.567	2.33	6.567	4.66	9.57	2.04
0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.600	1.46	3.600	2.33	6.600	4.66	9.60	2.04
0.617	1.46	3.617	2.33	6.617	4.66	9.62	2.04
0.633	1.46	3.633	2.33	6.633	4.66	9.63	2.04
0.650	1.46	3.650	2.33	6.650	4.66	9.65	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.683	1.46	3.683	2.33	6.683	4.66	9.68	2.04
0.700	1.46	3.700	2.33	6.700	4.66	9.70	2.04
0.717	1.46	3.717	2.33	6.717	4.66	9.72	2.04
0.733	1.46	3.733	2.33	6.733	4.66	9.73	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.767	1.46	3.767	2.33	6.767	4.66	9.77	2.04
0.783	1.46	3.783	2.33	6.783	4.66	9.78	2.04
0.800	1.46	3.800	2.33	6.800	4.66	9.80	2.04
0.817	1.46	3.817	2.33	6.817	4.66	9.82	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.850	1.46	3.850	2.33	6.850	4.66	9.85	2.04
0.867	1.46	3.867	2.33	6.867	4.66	9.87	2.04
0.883	1.46	3.883	2.33	6.883	4.66	9.88	2.04
0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04
0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17
1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17

1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17
1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17
1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17
2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17
2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17
2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17

2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.025 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 18.711
TOTAL RAINFALL (mm)= 58.270
RUNOFF COEFFICIENT = 0.321

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

CALIB
STANDHYD (0007) | Area (ha)= 1.75
ID= 1 DT= 1.0 min | Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	1.46	3.017	2.33	6.017	10.49	9.02	2.04
0.033	1.46	3.033	2.33	6.033	10.49	9.03	2.04
0.050	1.46	3.050	2.33	6.050	10.49	9.05	2.04
0.067	1.46	3.067	2.33	6.067	10.49	9.07	2.04
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.100	1.46	3.100	2.33	6.100	10.49	9.10	2.04
0.117	1.46	3.117	2.33	6.117	10.49	9.12	2.04
0.133	1.46	3.133	2.33	6.133	10.49	9.13	2.04
0.150	1.46	3.150	2.33	6.150	10.49	9.15	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.183	1.46	3.183	2.33	6.183	10.49	9.18	2.04
0.200	1.46	3.200	2.33	6.200	10.49	9.20	2.04
0.217	1.46	3.217	2.33	6.217	10.49	9.22	2.04
0.233	1.46	3.233	2.33	6.233	10.49	9.23	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.267	1.46	3.267	2.33	6.267	10.49	9.27	2.04
0.283	1.46	3.283	2.33	6.283	10.49	9.28	2.04
0.300	1.46	3.300	2.33	6.300	10.49	9.30	2.04
0.317	1.46	3.317	2.33	6.317	10.49	9.32	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.350	1.46	3.350	2.33	6.350	10.49	9.35	2.04
0.367	1.46	3.367	2.33	6.367	10.49	9.37	2.04
0.383	1.46	3.383	2.33	6.383	10.49	9.38	2.04
0.400	1.46	3.400	2.33	6.400	10.49	9.40	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.433	1.46	3.433	2.33	6.433	10.49	9.43	2.04
0.450	1.46	3.450	2.33	6.450	10.49	9.45	2.04
0.467	1.46	3.467	2.33	6.467	10.49	9.47	2.04
0.483	1.46	3.483	2.33	6.483	10.49	9.48	2.04
0.500	1.46	3.500	2.33	6.500	10.48	9.50	2.04
0.517	1.46	3.517	2.33	6.517	4.66	9.52	2.04
0.533	1.46	3.533	2.33	6.533	4.66	9.53	2.04
0.550	1.46	3.550	2.33	6.550	4.66	9.55	2.04
0.567	1.46	3.567	2.33	6.567	4.66	9.57	2.04
0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.600	1.46	3.600	2.33	6.600	4.66	9.60	2.04
0.617	1.46	3.617	2.33	6.617	4.66	9.62	2.04
0.633	1.46	3.633	2.33	6.633	4.66	9.63	2.04
0.650	1.46	3.650	2.33	6.650	4.66	9.65	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04

0.683	1.46	3.683	2.33	6.683	4.66	9.68	2.04
0.700	1.46	3.700	2.33	6.700	4.66	9.70	2.04
0.717	1.46	3.717	2.33	6.717	4.66	9.72	2.04
0.733	1.46	3.733	2.33	6.733	4.66	9.73	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.767	1.46	3.767	2.33	6.767	4.66	9.77	2.04
0.783	1.46	3.783	2.33	6.783	4.66	9.78	2.04
0.800	1.46	3.800	2.33	6.800	4.66	9.80	2.04
0.817	1.46	3.817	2.33	6.817	4.66	9.82	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.850	1.46	3.850	2.33	6.850	4.66	9.85	2.04
0.867	1.46	3.867	2.33	6.867	4.66	9.87	2.04
0.883	1.46	3.883	2.33	6.883	4.66	9.88	2.04
0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04
0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17
1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17
1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17
1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17
1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17

2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17
2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17
2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17
2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Max.Eff.Inten.(mm/hr)=	76.92	18.49	
over (min)	5.00	11.00	
Storage Coeff. (min)=	2.97 (ii)	10.22 (ii)	
Unit Hyd. Tpeak (min)=	5.00	11.00	
Unit Hyd. peak (cms)=	0.31	0.11	
			TOTALS
PEAK FLOW (cms)=	0.19	0.03	0.210 (iii)
TIME TO PEAK (hrs)=	6.00	6.08	6.00
RUNOFF VOLUME (mm)=	57.27	9.73	33.97
TOTAL RAINFALL (mm)=	58.27	58.27	58.27
RUNOFF COEFFICIENT =	0.98	0.17	0.58

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

ADD HYD (0018)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0026):	0.27	0.025	6.00	18.71
	+ ID2= 2 (0007):	1.75	0.210	6.00	33.97
	ID = 3 (0018):	2.02	0.235	6.00	31.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0009)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0007	0.0212	0.0291
	0.0037	0.0045	0.0402	0.0316
	0.0053	0.0065	0.1203	0.0341
	0.0081	0.0128	0.2476	0.0366
	0.0101	0.0188	0.3901	0.0373
	0.0118	0.0250	0.4841	0.0381
	0.0126	0.0279	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0018)	2.020	0.235	6.00	31.93
OUTFLOW: ID= 1 (0009)	2.020	0.083	6.13	31.46

PEAK FLOW REDUCTION [Qout/Qin](%)= 35.15
TIME SHIFT OF PEAK FLOW (min)= 8.00
MAXIMUM STORAGE USED (ha.m.)= 0.0329

CALIB NASHYD (0027)	Area (ha)= 16.11	Curve Number (CN)= 61.0
ID= 1 DT= 1.0 min	Ia (mm)= 5.60	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.95	

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	1.46	3.017	2.33	6.017	10.49	9.02	2.04
0.033	1.46	3.033	2.33	6.033	10.49	9.03	2.04
0.050	1.46	3.050	2.33	6.050	10.49	9.05	2.04
0.067	1.46	3.067	2.33	6.067	10.49	9.07	2.04
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.100	1.46	3.100	2.33	6.100	10.49	9.10	2.04
0.117	1.46	3.117	2.33	6.117	10.49	9.12	2.04
0.133	1.46	3.133	2.33	6.133	10.49	9.13	2.04
0.150	1.46	3.150	2.33	6.150	10.49	9.15	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.183	1.46	3.183	2.33	6.183	10.49	9.18	2.04
0.200	1.46	3.200	2.33	6.200	10.49	9.20	2.04
0.217	1.46	3.217	2.33	6.217	10.49	9.22	2.04
0.233	1.46	3.233	2.33	6.233	10.49	9.23	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.267	1.46	3.267	2.33	6.267	10.49	9.27	2.04
0.283	1.46	3.283	2.33	6.283	10.49	9.28	2.04
0.300	1.46	3.300	2.33	6.300	10.49	9.30	2.04
0.317	1.46	3.317	2.33	6.317	10.49	9.32	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.350	1.46	3.350	2.33	6.350	10.49	9.35	2.04
0.367	1.46	3.367	2.33	6.367	10.49	9.37	2.04
0.383	1.46	3.383	2.33	6.383	10.49	9.38	2.04
0.400	1.46	3.400	2.33	6.400	10.49	9.40	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.433	1.46	3.433	2.33	6.433	10.49	9.43	2.04
0.450	1.46	3.450	2.33	6.450	10.49	9.45	2.04
0.467	1.46	3.467	2.33	6.467	10.49	9.47	2.04
0.483	1.46	3.483	2.33	6.483	10.49	9.48	2.04

0.500	1.46	3.500	2.33	6.500	10.48	9.50	2.04
0.517	1.46	3.517	2.33	6.517	4.66	9.52	2.04
0.533	1.46	3.533	2.33	6.533	4.66	9.53	2.04
0.550	1.46	3.550	2.33	6.550	4.66	9.55	2.04
0.567	1.46	3.567	2.33	6.567	4.66	9.57	2.04
0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.600	1.46	3.600	2.33	6.600	4.66	9.60	2.04
0.617	1.46	3.617	2.33	6.617	4.66	9.62	2.04
0.633	1.46	3.633	2.33	6.633	4.66	9.63	2.04
0.650	1.46	3.650	2.33	6.650	4.66	9.65	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.683	1.46	3.683	2.33	6.683	4.66	9.68	2.04
0.700	1.46	3.700	2.33	6.700	4.66	9.70	2.04
0.717	1.46	3.717	2.33	6.717	4.66	9.72	2.04
0.733	1.46	3.733	2.33	6.733	4.66	9.73	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.767	1.46	3.767	2.33	6.767	4.66	9.77	2.04
0.783	1.46	3.783	2.33	6.783	4.66	9.78	2.04
0.800	1.46	3.800	2.33	6.800	4.66	9.80	2.04
0.817	1.46	3.817	2.33	6.817	4.66	9.82	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.850	1.46	3.850	2.33	6.850	4.66	9.85	2.04
0.867	1.46	3.867	2.33	6.867	4.66	9.87	2.04
0.883	1.46	3.883	2.33	6.883	4.66	9.88	2.04
0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04
0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17
1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17
1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17

1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17
1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17
2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17
2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17
2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17
2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.196 (i)
TIME TO PEAK (hrs)= 7.000
RUNOFF VOLUME (mm)= 12.898
TOTAL RAINFALL (mm)= 58.270

RUNOFF COEFFICIENT = 0.221

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

CALIB STANDHYD (0006) ID= 1 DT= 1.0 min	Area (ha)= 0.75 Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.68	0.08
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	70.71	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	1.46	3.017	2.33	6.017	10.49	9.02	2.04
0.033	1.46	3.033	2.33	6.033	10.49	9.03	2.04
0.050	1.46	3.050	2.33	6.050	10.49	9.05	2.04
0.067	1.46	3.067	2.33	6.067	10.49	9.07	2.04
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.100	1.46	3.100	2.33	6.100	10.49	9.10	2.04
0.117	1.46	3.117	2.33	6.117	10.49	9.12	2.04
0.133	1.46	3.133	2.33	6.133	10.49	9.13	2.04
0.150	1.46	3.150	2.33	6.150	10.49	9.15	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.183	1.46	3.183	2.33	6.183	10.49	9.18	2.04
0.200	1.46	3.200	2.33	6.200	10.49	9.20	2.04
0.217	1.46	3.217	2.33	6.217	10.49	9.22	2.04
0.233	1.46	3.233	2.33	6.233	10.49	9.23	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.267	1.46	3.267	2.33	6.267	10.49	9.27	2.04
0.283	1.46	3.283	2.33	6.283	10.49	9.28	2.04
0.300	1.46	3.300	2.33	6.300	10.49	9.30	2.04
0.317	1.46	3.317	2.33	6.317	10.49	9.32	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.350	1.46	3.350	2.33	6.350	10.49	9.35	2.04
0.367	1.46	3.367	2.33	6.367	10.49	9.37	2.04
0.383	1.46	3.383	2.33	6.383	10.49	9.38	2.04
0.400	1.46	3.400	2.33	6.400	10.49	9.40	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.433	1.46	3.433	2.33	6.433	10.49	9.43	2.04
0.450	1.46	3.450	2.33	6.450	10.49	9.45	2.04
0.467	1.46	3.467	2.33	6.467	10.49	9.47	2.04
0.483	1.46	3.483	2.33	6.483	10.49	9.48	2.04
0.500	1.46	3.500	2.33	6.500	10.48	9.50	2.04
0.517	1.46	3.517	2.33	6.517	4.66	9.52	2.04
0.533	1.46	3.533	2.33	6.533	4.66	9.53	2.04
0.550	1.46	3.550	2.33	6.550	4.66	9.55	2.04
0.567	1.46	3.567	2.33	6.567	4.66	9.57	2.04
0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.600	1.46	3.600	2.33	6.600	4.66	9.60	2.04
0.617	1.46	3.617	2.33	6.617	4.66	9.62	2.04
0.633	1.46	3.633	2.33	6.633	4.66	9.63	2.04
0.650	1.46	3.650	2.33	6.650	4.66	9.65	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.683	1.46	3.683	2.33	6.683	4.66	9.68	2.04
0.700	1.46	3.700	2.33	6.700	4.66	9.70	2.04
0.717	1.46	3.717	2.33	6.717	4.66	9.72	2.04
0.733	1.46	3.733	2.33	6.733	4.66	9.73	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.767	1.46	3.767	2.33	6.767	4.66	9.77	2.04
0.783	1.46	3.783	2.33	6.783	4.66	9.78	2.04
0.800	1.46	3.800	2.33	6.800	4.66	9.80	2.04
0.817	1.46	3.817	2.33	6.817	4.66	9.82	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.850	1.46	3.850	2.33	6.850	4.66	9.85	2.04
0.867	1.46	3.867	2.33	6.867	4.66	9.87	2.04
0.883	1.46	3.883	2.33	6.883	4.66	9.88	2.04
0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04

0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17
1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17
1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17
1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17
1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17
2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17
2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17

2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17
2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17
2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Max.Eff.Inten.(mm/hr)=	76.92	80.41	
over (min)	5.00	6.00	
Storage Coeff. (min)=	2.30 (ii)	5.82 (ii)	
Unit Hyd. Tpeak (min)=	5.00	6.00	
Unit Hyd. peak (cms)=	0.35	0.19	
			TOTALS
PEAK FLOW (cms)=	0.12	0.01	0.132 (iii)
TIME TO PEAK (hrs)=	6.00	6.02	6.00
RUNOFF VOLUME (mm)=	57.27	19.07	47.33
TOTAL RAINFALL (mm)=	58.27	58.27	58.27
RUNOFF COEFFICIENT =	0.98	0.33	0.81

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0011)| 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	0.0912	0.0179
	0.0006	0.0005	0.1027	0.0204
	0.0062	0.0056	0.1264	0.0248
	0.0100	0.0060	0.1349	0.0263
	0.0470	0.0101	0.0000	0.0000

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

```
   INFLOW : ID= 2 (  0006)      0.750      0.132      6.00      47.33
   OUTFLOW: ID= 1 (  0011)      0.750      0.069      6.08      47.05

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.76
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0139

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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    1.46 | 3.017    2.33 | 6.017   10.49 |  9.02    2.04
 0.033    1.46 | 3.033    2.33 | 6.033   10.49 |  9.03    2.04
 0.050    1.46 | 3.050    2.33 | 6.050   10.49 |  9.05    2.04
 0.067    1.46 | 3.067    2.33 | 6.067   10.49 |  9.07    2.04
 0.083    1.46 | 3.083    2.33 | 6.083   10.49 |  9.08    2.04
 0.100    1.46 | 3.100    2.33 | 6.100   10.49 |  9.10    2.04
 0.117    1.46 | 3.117    2.33 | 6.117   10.49 |  9.12    2.04
 0.133    1.46 | 3.133    2.33 | 6.133   10.49 |  9.13    2.04
 0.150    1.46 | 3.150    2.33 | 6.150   10.49 |  9.15    2.04
 0.167    1.46 | 3.167    2.33 | 6.167   10.49 |  9.17    2.04
 0.183    1.46 | 3.183    2.33 | 6.183   10.49 |  9.18    2.04
 0.200    1.46 | 3.200    2.33 | 6.200   10.49 |  9.20    2.04
 0.217    1.46 | 3.217    2.33 | 6.217   10.49 |  9.22    2.04
 0.233    1.46 | 3.233    2.33 | 6.233   10.49 |  9.23    2.04
 0.250    1.46 | 3.250    2.33 | 6.250   10.49 |  9.25    2.04
 0.267    1.46 | 3.267    2.33 | 6.267   10.49 |  9.27    2.04
 0.283    1.46 | 3.283    2.33 | 6.283   10.49 |  9.28    2.04
 0.300    1.46 | 3.300    2.33 | 6.300   10.49 |  9.30    2.04
 0.317    1.46 | 3.317    2.33 | 6.317   10.49 |  9.32    2.04
 0.333    1.46 | 3.333    2.33 | 6.333   10.49 |  9.33    2.04
 0.350    1.46 | 3.350    2.33 | 6.350   10.49 |  9.35    2.04
 0.367    1.46 | 3.367    2.33 | 6.367   10.49 |  9.37    2.04
 0.383    1.46 | 3.383    2.33 | 6.383   10.49 |  9.38    2.04
 0.400    1.46 | 3.400    2.33 | 6.400   10.49 |  9.40    2.04
 0.417    1.46 | 3.417    2.33 | 6.417   10.49 |  9.42    2.04
 0.433    1.46 | 3.433    2.33 | 6.433   10.49 |  9.43    2.04
 0.450    1.46 | 3.450    2.33 | 6.450   10.49 |  9.45    2.04
 0.467    1.46 | 3.467    2.33 | 6.467   10.49 |  9.47    2.04
 0.483    1.46 | 3.483    2.33 | 6.483   10.49 |  9.48    2.04
 0.500    1.46 | 3.500    2.33 | 6.500   10.48 |  9.50    2.04
 0.517    1.46 | 3.517    2.33 | 6.517    4.66 |  9.52    2.04
 0.533    1.46 | 3.533    2.33 | 6.533    4.66 |  9.53    2.04
 0.550    1.46 | 3.550    2.33 | 6.550    4.66 |  9.55    2.04
 0.567    1.46 | 3.567    2.33 | 6.567    4.66 |  9.57    2.04
 0.583    1.46 | 3.583    2.33 | 6.583    4.66 |  9.58    2.04
 0.600    1.46 | 3.600    2.33 | 6.600    4.66 |  9.60    2.04
 0.617    1.46 | 3.617    2.33 | 6.617    4.66 |  9.62    2.04
 0.633    1.46 | 3.633    2.33 | 6.633    4.66 |  9.63    2.04
 0.650    1.46 | 3.650    2.33 | 6.650    4.66 |  9.65    2.04
 0.667    1.46 | 3.667    2.33 | 6.667    4.66 |  9.67    2.04
 0.683    1.46 | 3.683    2.33 | 6.683    4.66 |  9.68    2.04
 0.700    1.46 | 3.700    2.33 | 6.700    4.66 |  9.70    2.04
 0.717    1.46 | 3.717    2.33 | 6.717    4.66 |  9.72    2.04
 0.733    1.46 | 3.733    2.33 | 6.733    4.66 |  9.73    2.04
 0.750    1.46 | 3.750    2.33 | 6.750    4.66 |  9.75    2.04
 0.767    1.46 | 3.767    2.33 | 6.767    4.66 |  9.77    2.04
 0.783    1.46 | 3.783    2.33 | 6.783    4.66 |  9.78    2.04
 0.800    1.46 | 3.800    2.33 | 6.800    4.66 |  9.80    2.04
 0.817    1.46 | 3.817    2.33 | 6.817    4.66 |  9.82    2.04
 0.833    1.46 | 3.833    2.33 | 6.833    4.66 |  9.83    2.04
 0.850    1.46 | 3.850    2.33 | 6.850    4.66 |  9.85    2.04
 0.867    1.46 | 3.867    2.33 | 6.867    4.66 |  9.87    2.04
 0.883    1.46 | 3.883    2.33 | 6.883    4.66 |  9.88    2.04
```

0.900	1.46	3.900	2.33	6.900	4.66	9.90	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
0.933	1.46	3.933	2.33	6.933	4.66	9.93	2.04
0.950	1.46	3.950	2.33	6.950	4.66	9.95	2.04
0.967	1.46	3.967	2.33	6.967	4.66	9.97	2.04
0.983	1.46	3.983	2.33	6.983	4.66	9.98	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.017	1.46	4.017	3.50	7.017	3.50	10.02	1.17
1.033	1.46	4.033	3.50	7.033	3.50	10.03	1.17
1.050	1.46	4.050	3.50	7.050	3.50	10.05	1.17
1.067	1.46	4.067	3.50	7.067	3.50	10.07	1.17
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.100	1.46	4.100	3.50	7.100	3.50	10.10	1.17
1.117	1.46	4.117	3.50	7.117	3.50	10.12	1.17
1.133	1.46	4.133	3.50	7.133	3.50	10.13	1.17
1.150	1.46	4.150	3.50	7.150	3.50	10.15	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.183	1.46	4.183	3.50	7.183	3.50	10.18	1.17
1.200	1.46	4.200	3.50	7.200	3.50	10.20	1.17
1.217	1.46	4.217	3.50	7.217	3.50	10.22	1.17
1.233	1.46	4.233	3.50	7.233	3.50	10.23	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.267	1.46	4.267	3.50	7.267	3.50	10.27	1.17
1.283	1.46	4.283	3.50	7.283	3.50	10.28	1.17
1.300	1.46	4.300	3.50	7.300	3.50	10.30	1.17
1.317	1.46	4.317	3.50	7.317	3.50	10.32	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.350	1.46	4.350	3.50	7.350	3.50	10.35	1.17
1.367	1.46	4.367	3.50	7.367	3.50	10.37	1.17
1.383	1.46	4.383	3.50	7.383	3.50	10.38	1.17
1.400	1.46	4.400	3.50	7.400	3.50	10.40	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.433	1.46	4.433	3.50	7.433	3.50	10.43	1.17
1.450	1.46	4.450	3.50	7.450	3.50	10.45	1.17
1.467	1.46	4.467	3.50	7.467	3.50	10.47	1.17
1.483	1.46	4.483	3.50	7.483	3.50	10.48	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.517	1.46	4.517	4.66	7.517	3.50	10.52	1.17
1.533	1.46	4.533	4.66	7.533	3.50	10.53	1.17
1.550	1.46	4.550	4.66	7.550	3.50	10.55	1.17
1.567	1.46	4.567	4.66	7.567	3.50	10.57	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.600	1.46	4.600	4.66	7.600	3.50	10.60	1.17
1.617	1.46	4.617	4.66	7.617	3.50	10.62	1.17
1.633	1.46	4.633	4.66	7.633	3.50	10.63	1.17
1.650	1.46	4.650	4.66	7.650	3.50	10.65	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.683	1.46	4.683	4.66	7.683	3.50	10.68	1.17
1.700	1.46	4.700	4.66	7.700	3.50	10.70	1.17
1.717	1.46	4.717	4.66	7.717	3.50	10.72	1.17
1.733	1.46	4.733	4.66	7.733	3.50	10.73	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.767	1.46	4.767	4.66	7.767	3.50	10.77	1.17
1.783	1.46	4.783	4.66	7.783	3.50	10.78	1.17
1.800	1.46	4.800	4.66	7.800	3.50	10.80	1.17
1.817	1.46	4.817	4.66	7.817	3.50	10.82	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.850	1.46	4.850	4.66	7.850	3.50	10.85	1.17
1.867	1.46	4.867	4.66	7.867	3.50	10.87	1.17
1.883	1.46	4.883	4.66	7.883	3.50	10.88	1.17
1.900	1.46	4.900	4.66	7.900	3.50	10.90	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
1.933	1.46	4.933	4.66	7.933	3.50	10.93	1.17
1.950	1.46	4.950	4.66	7.950	3.50	10.95	1.17
1.967	1.46	4.967	4.66	7.967	3.50	10.97	1.17
1.983	1.46	4.983	4.66	7.983	3.50	10.98	1.17
2.000	1.46	5.000	4.66	8.000	3.49	11.00	1.17
2.017	1.75	5.017	6.99	8.017	2.04	11.02	1.17
2.033	1.75	5.033	6.99	8.033	2.04	11.03	1.17
2.050	1.75	5.050	6.99	8.050	2.04	11.05	1.17
2.067	1.75	5.067	6.99	8.067	2.04	11.07	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.100	1.75	5.100	6.99	8.100	2.04	11.10	1.17
2.117	1.75	5.117	6.99	8.117	2.04	11.12	1.17
2.133	1.75	5.133	6.99	8.133	2.04	11.13	1.17
2.150	1.75	5.150	6.99	8.150	2.04	11.15	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.183	1.75	5.183	6.99	8.183	2.04	11.18	1.17
2.200	1.75	5.200	6.99	8.200	2.04	11.20	1.17

2.217	1.75	5.217	6.99	8.217	2.04	11.22	1.17
2.233	1.75	5.233	6.99	8.233	2.04	11.23	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.267	1.75	5.267	6.99	8.267	2.04	11.27	1.17
2.283	1.75	5.283	6.99	8.283	2.04	11.28	1.17
2.300	1.75	5.300	6.99	8.300	2.04	11.30	1.17
2.317	1.75	5.317	6.99	8.317	2.04	11.32	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.350	1.75	5.350	6.99	8.350	2.04	11.35	1.17
2.367	1.75	5.367	6.99	8.367	2.04	11.37	1.17
2.383	1.75	5.383	6.99	8.383	2.04	11.38	1.17
2.400	1.75	5.400	6.99	8.400	2.04	11.40	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.433	1.75	5.433	6.99	8.433	2.04	11.43	1.17
2.450	1.75	5.450	6.99	8.450	2.04	11.45	1.17
2.467	1.75	5.467	6.99	8.467	2.04	11.47	1.17
2.483	1.75	5.483	6.99	8.483	2.04	11.48	1.17
2.500	1.75	5.500	7.01	8.500	2.04	11.50	1.17
2.517	1.75	5.517	27.97	8.517	2.04	11.52	1.17
2.533	1.75	5.533	27.97	8.533	2.04	11.53	1.17
2.550	1.75	5.550	27.97	8.550	2.04	11.55	1.17
2.567	1.75	5.567	27.97	8.567	2.04	11.57	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.600	1.75	5.600	27.97	8.600	2.04	11.60	1.17
2.617	1.75	5.617	27.97	8.617	2.04	11.62	1.17
2.633	1.75	5.633	27.97	8.633	2.04	11.63	1.17
2.650	1.75	5.650	27.97	8.650	2.04	11.65	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.683	1.75	5.683	27.97	8.683	2.04	11.68	1.17
2.700	1.75	5.700	27.97	8.700	2.04	11.70	1.17
2.717	1.75	5.717	27.97	8.717	2.04	11.72	1.17
2.733	1.75	5.733	27.97	8.733	2.04	11.73	1.17
2.750	1.75	5.750	28.03	8.750	2.04	11.75	1.17
2.767	1.75	5.767	76.92	8.767	2.04	11.77	1.17
2.783	1.75	5.783	76.92	8.783	2.04	11.78	1.17
2.800	1.75	5.800	76.92	8.800	2.04	11.80	1.17
2.817	1.75	5.817	76.92	8.817	2.04	11.82	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.850	1.75	5.850	76.92	8.850	2.04	11.85	1.17
2.867	1.75	5.867	76.92	8.867	2.04	11.87	1.17
2.883	1.75	5.883	76.92	8.883	2.04	11.88	1.17
2.900	1.75	5.900	76.92	8.900	2.04	11.90	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
2.933	1.75	5.933	76.92	8.933	2.04	11.93	1.17
2.950	1.75	5.950	76.92	8.950	2.04	11.95	1.17
2.967	1.75	5.967	76.92	8.967	2.04	11.97	1.17
2.983	1.75	5.983	76.92	8.983	2.04	11.98	1.17
3.000	1.75	6.000	76.82	9.000	2.04	12.00	1.17

Max.Eff.Inten.(mm/hr)=	76.92	24.22	
over (min)	5.00	11.00	
Storage Coeff. (min)=	3.18 (ii)	10.74 (ii)	
Unit Hyd. Tpeak (min)=	5.00	11.00	
Unit Hyd. peak (cms)=	0.30	0.10	
			TOTALS
PEAK FLOW (cms)=	0.21	0.04	0.242 (iii)
TIME TO PEAK (hrs)=	6.00	6.10	6.00
RUNOFF VOLUME (mm)=	57.27	11.10	31.87
TOTAL RAINFALL (mm)=	58.27	58.27	58.27
RUNOFF COEFFICIENT =	0.98	0.19	0.55

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)	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		0.0570	0.0442		
0.0008	0.0012		0.0640	0.0503		
0.0063	0.0138		0.0780	0.0611		
0.0090	0.0149		0.0830	0.0649		
0.0320	0.0249		0.0000	0.0000		

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)	2.200	0.242	6.00	31.87
OUTFLOW: ID= 1 (0010)	2.200	0.048	6.37	31.70

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.71
TIME SHIFT OF PEAK FLOW (min)= 22.00
MAXIMUM STORAGE USED (ha.m.)= 0.0370

CALIB STANDHYD (0039) ID= 1 DT= 5.0 min	Area (ha)= 0.08 Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.04	0.04
Dep. Storage	(mm)=	1.00	2.30
Average Slope	(%)=	1.00	2.00
Length	(m)=	23.09	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.46	3.083	2.33	6.083	10.49	9.08	2.04
0.167	1.46	3.167	2.33	6.167	10.49	9.17	2.04
0.250	1.46	3.250	2.33	6.250	10.49	9.25	2.04
0.333	1.46	3.333	2.33	6.333	10.49	9.33	2.04
0.417	1.46	3.417	2.33	6.417	10.49	9.42	2.04
0.500	1.46	3.500	2.33	6.500	10.49	9.50	2.04
0.583	1.46	3.583	2.33	6.583	4.66	9.58	2.04
0.667	1.46	3.667	2.33	6.667	4.66	9.67	2.04
0.750	1.46	3.750	2.33	6.750	4.66	9.75	2.04
0.833	1.46	3.833	2.33	6.833	4.66	9.83	2.04
0.917	1.46	3.917	2.33	6.917	4.66	9.92	2.04
1.000	1.46	4.000	2.33	7.000	4.66	10.00	2.04
1.083	1.46	4.083	3.50	7.083	3.50	10.08	1.17
1.167	1.46	4.167	3.50	7.167	3.50	10.17	1.17
1.250	1.46	4.250	3.50	7.250	3.50	10.25	1.17
1.333	1.46	4.333	3.50	7.333	3.50	10.33	1.17
1.417	1.46	4.417	3.50	7.417	3.50	10.42	1.17
1.500	1.46	4.500	3.50	7.500	3.50	10.50	1.17
1.583	1.46	4.583	4.66	7.583	3.50	10.58	1.17
1.667	1.46	4.667	4.66	7.667	3.50	10.67	1.17
1.750	1.46	4.750	4.66	7.750	3.50	10.75	1.17
1.833	1.46	4.833	4.66	7.833	3.50	10.83	1.17
1.917	1.46	4.917	4.66	7.917	3.50	10.92	1.17
2.000	1.46	5.000	4.66	8.000	3.50	11.00	1.17
2.083	1.75	5.083	6.99	8.083	2.04	11.08	1.17
2.167	1.75	5.167	6.99	8.167	2.04	11.17	1.17
2.250	1.75	5.250	6.99	8.250	2.04	11.25	1.17
2.333	1.75	5.333	6.99	8.333	2.04	11.33	1.17
2.417	1.75	5.417	6.99	8.417	2.04	11.42	1.17
2.500	1.75	5.500	6.99	8.500	2.04	11.50	1.17
2.583	1.75	5.583	27.97	8.583	2.04	11.58	1.17
2.667	1.75	5.667	27.97	8.667	2.04	11.67	1.17
2.750	1.75	5.750	27.97	8.750	2.04	11.75	1.17
2.833	1.75	5.833	76.92	8.833	2.04	11.83	1.17
2.917	1.75	5.917	76.92	8.917	2.04	11.92	1.17
3.000	1.75	6.000	76.92	9.000	2.04	12.00	1.17

Max.Eff.Inten.(mm/hr)=		76.92	92.18	
over (min)		5.00	10.00	
Storage Coeff. (min)=		1.18 (ii)	8.47 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.33	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.01	0.01	0.014 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	57.27	46.28	50.07
TOTAL RAINFALL	(mm)=	58.27	58.27	58.27
RUNOFF COEFFICIENT	=	0.98	0.79	0.86

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

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  94.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.20   0.048     6.37    31.70
      + ID2= 2 (  0011):     0.75   0.069     6.08    47.05
        ====================================================
        ID = 3 (  0004):     2.95   0.113     6.10    35.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):     2.95   0.113     6.10    35.60
      + ID2= 2 (  0027):    16.11   0.196     7.00    12.90
        ====================================================
        ID = 1 (  0004):    19.06   0.257     6.83    16.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    19.06   0.257     6.83    16.41
      + ID2= 2 (  0003):     4.63   0.015    10.05    19.18
        ====================================================
        ID = 3 (  0004):    23.69   0.270     6.85    16.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):    23.69   0.270     6.85    16.95
      + ID2= 2 (  0039):     0.08   0.014     6.00    50.07
        ====================================================
        ID = 1 (  0004):    23.77   0.271     6.85    17.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    23.77   0.271     6.85    17.06
      + ID2= 2 (  0009):     2.02   0.083     6.13    31.46
        ====================================================
        ID = 3 (  0004):    25.79   0.304     6.67    18.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  ***********************************************
  ** SIMULATION : Run 09                       **
  ***********************************************



--------------------
|    READ STORM    |    Filename: C:\Users\pcallaghan\AppD
|                  |              ata\Local\Temp\
|                  |              d1c59b48-457d-442d-8825-8b87b5d6c641\f24b7e6f
| Ptotal= 68.87 mm |    Comments: 10-Year 12-Hour SCS II Design Storm
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.72	3.25	2.75	6.25	12.40	9.25	2.41
0.50	1.72	3.50	2.75	6.50	12.40	9.50	2.41
0.75	1.72	3.75	2.75	6.75	5.51	9.75	2.41
1.00	1.72	4.00	2.75	7.00	5.51	10.00	2.41
1.25	1.72	4.25	4.13	7.25	4.13	10.25	1.38
1.50	1.72	4.50	4.13	7.50	4.13	10.50	1.38
1.75	1.72	4.75	5.51	7.75	4.13	10.75	1.38
2.00	1.72	5.00	5.51	8.00	4.13	11.00	1.38
2.25	2.07	5.25	8.26	8.25	2.41	11.25	1.38
2.50	2.07	5.50	8.26	8.50	2.41	11.50	1.38
2.75	2.07	5.75	33.06	8.75	2.41	11.75	1.38
3.00	2.07	6.00	90.91	9.00	2.41	12.00	1.38

CALIB			
NASHYD (0025)	Area (ha)=	1.43	Curve Number (CN)= 67.0
ID= 1 DT= 1.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.34	

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	1.72	3.017	2.75	6.017	12.40	9.02	2.41
0.033	1.72	3.033	2.75	6.033	12.40	9.03	2.41
0.050	1.72	3.050	2.75	6.050	12.40	9.05	2.41
0.067	1.72	3.067	2.75	6.067	12.40	9.07	2.41
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.100	1.72	3.100	2.75	6.100	12.40	9.10	2.41
0.117	1.72	3.117	2.75	6.117	12.40	9.12	2.41
0.133	1.72	3.133	2.75	6.133	12.40	9.13	2.41
0.150	1.72	3.150	2.75	6.150	12.40	9.15	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.183	1.72	3.183	2.75	6.183	12.40	9.18	2.41
0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41
0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41
0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41
0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41

0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38
1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38
1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38
1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38
1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38

2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38
2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38
2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
2.933	2.07	5.933	90.91	8.933	2.41	11.93	1.38
2.950	2.07	5.950	90.91	8.950	2.41	11.95	1.38
2.967	2.07	5.967	90.91	8.967	2.41	11.97	1.38
2.983	2.07	5.983	90.91	8.983	2.41	11.98	1.38
3.000	2.07	6.000	90.80	9.000	2.41	12.00	1.38

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.062 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 21.585
TOTAL RAINFALL (mm)= 68.867
RUNOFF COEFFICIENT = 0.313

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

CALIB	
STANDHYD (0001)	Area (ha)= 2.91
ID= 1 DT= 1.0 min	Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	1.72	3.017	2.75	6.017	12.40	9.02	2.41
0.033	1.72	3.033	2.75	6.033	12.40	9.03	2.41
0.050	1.72	3.050	2.75	6.050	12.40	9.05	2.41
0.067	1.72	3.067	2.75	6.067	12.40	9.07	2.41
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.100	1.72	3.100	2.75	6.100	12.40	9.10	2.41
0.117	1.72	3.117	2.75	6.117	12.40	9.12	2.41
0.133	1.72	3.133	2.75	6.133	12.40	9.13	2.41
0.150	1.72	3.150	2.75	6.150	12.40	9.15	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.183	1.72	3.183	2.75	6.183	12.40	9.18	2.41
0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41
0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41
0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41
0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38

1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38
1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38
1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38
1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38
2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38

2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
2.933	2.07	5.933	90.91	8.933	2.41	11.93	1.38
2.950	2.07	5.950	90.91	8.950	2.41	11.95	1.38
2.967	2.07	5.967	90.91	8.967	2.41	11.97	1.38
2.983	2.07	5.983	90.91	8.983	2.41	11.98	1.38
3.000	2.07	6.000	90.80	9.000	2.41	12.00	1.38

Max.Eff.Inten.(mm/hr)=	90.91	23.35	
over (min)	5.00	9.00	
Storage Coeff. (min)=	2.87 (ii)	8.99 (ii)	
Unit Hyd. Tpeak (min)=	5.00	9.00	
Unit Hyd. peak (cms)=	0.31	0.13	
			TOTALS
PEAK FLOW (cms)=	0.37	0.06	0.425 (iii)
TIME TO PEAK (hrs)=	6.00	6.07	6.00
RUNOFF VOLUME (mm)=	67.86	12.89	40.93
TOTAL RAINFALL (mm)=	68.87	68.87	68.87
RUNOFF COEFFICIENT =	0.99	0.19	0.59

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0028)	Area (ha)= 0.29
ID= 1 DT= 1.0 min	Total Imp(%)= 67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	1.72	3.017	2.75	6.017	12.40	9.02	2.41
0.033	1.72	3.033	2.75	6.033	12.40	9.03	2.41
0.050	1.72	3.050	2.75	6.050	12.40	9.05	2.41
0.067	1.72	3.067	2.75	6.067	12.40	9.07	2.41
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.100	1.72	3.100	2.75	6.100	12.40	9.10	2.41
0.117	1.72	3.117	2.75	6.117	12.40	9.12	2.41
0.133	1.72	3.133	2.75	6.133	12.40	9.13	2.41
0.150	1.72	3.150	2.75	6.150	12.40	9.15	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.183	1.72	3.183	2.75	6.183	12.40	9.18	2.41
0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41

0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41
0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41
0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38
1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38
1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38

1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38
1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38
1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38
2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38
2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38

```
               2.917    2.07 | 5.917   90.91 | 8.917    2.41 | 11.92    1.38
               2.933    2.07 | 5.933   90.91 | 8.933    2.41 | 11.93    1.38
               2.950    2.07 | 5.950   90.91 | 8.950    2.41 | 11.95    1.38
               2.967    2.07 | 5.967   90.91 | 8.967    2.41 | 11.97    1.38
               2.983    2.07 | 5.983   90.91 | 8.983    2.41 | 11.98    1.38
               3.000    2.07 | 6.000   90.80 | 9.000    2.41 | 12.00    1.38

     Max.Eff.Inten.(mm/hr)=      90.91        18.96
               over (min)        5.00         8.00
     Storage Coeff.  (min)=      1.62 (ii)    7.14 (ii)
     Unit Hyd. Tpeak (min)=      5.00         8.00
     Unit Hyd. peak  (cms)=      0.41         0.15
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.00          0.053 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.05          6.00
     RUNOFF VOLUME    (mm)=     67.87        11.64         49.30
     TOTAL RAINFALL   (mm)=     68.87        68.87         68.87
     RUNOFF COEFFICIENT   =      0.99         0.17          0.72


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.91   0.425     6.00    40.93
      + ID2= 2 (  0025):     1.43   0.062     6.25    21.58
        ================================================
        ID = 3 (  0016):     4.34   0.461     6.00    34.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.461     6.00    34.55
      + ID2= 2 (  0028):     0.29   0.053     6.00    49.30
        ================================================
        ID = 1 (  0016):     4.63   0.514     6.00    35.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0130      0.0895
                          0.0000     0.0291   |   0.0210      0.1555
                          0.0010     0.0332   |   0.0230      0.1780
                          0.0040     0.0496   |   0.0280      0.2176
                          0.0050     0.0537   |   0.0300      0.2309

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0016)     4.630      0.514      6.00      35.48
   OUTFLOW: ID= 1 (  0003)     4.630      0.018     10.07      24.79

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.47
                  TIME SHIFT OF PEAK FLOW         (min)=244.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1296

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0026)|   Area    (ha)=   0.27   Curve Number   (CN)= 71.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   3.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.02

         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	1.72	3.017	2.75	6.017	12.40	9.02	2.41
0.033	1.72	3.033	2.75	6.033	12.40	9.03	2.41
0.050	1.72	3.050	2.75	6.050	12.40	9.05	2.41
0.067	1.72	3.067	2.75	6.067	12.40	9.07	2.41
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.100	1.72	3.100	2.75	6.100	12.40	9.10	2.41
0.117	1.72	3.117	2.75	6.117	12.40	9.12	2.41
0.133	1.72	3.133	2.75	6.133	12.40	9.13	2.41
0.150	1.72	3.150	2.75	6.150	12.40	9.15	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.183	1.72	3.183	2.75	6.183	12.40	9.18	2.41
0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41
0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41
0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41
0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38

1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38
1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38
1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38
1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38
1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38

2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38
2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
2.933	2.07	5.933	90.91	8.933	2.41	11.93	1.38
2.950	2.07	5.950	90.91	8.950	2.41	11.95	1.38
2.967	2.07	5.967	90.91	8.967	2.41	11.97	1.38
2.983	2.07	5.983	90.91	8.983	2.41	11.98	1.38
3.000	2.07	6.000	90.80	9.000	2.41	12.00	1.38

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 24.914
TOTAL RAINFALL (mm)= 68.867
RUNOFF COEFFICIENT = 0.362

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

CALIB	
STANDHYD (0007)	Area (ha)= 1.75
ID= 1 DT= 1.0 min	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	1.72	3.017	2.75	6.017	12.40	9.02	2.41
0.033	1.72	3.033	2.75	6.033	12.40	9.03	2.41
0.050	1.72	3.050	2.75	6.050	12.40	9.05	2.41
0.067	1.72	3.067	2.75	6.067	12.40	9.07	2.41
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.100	1.72	3.100	2.75	6.100	12.40	9.10	2.41
0.117	1.72	3.117	2.75	6.117	12.40	9.12	2.41
0.133	1.72	3.133	2.75	6.133	12.40	9.13	2.41
0.150	1.72	3.150	2.75	6.150	12.40	9.15	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.183	1.72	3.183	2.75	6.183	12.40	9.18	2.41
0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41
0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41

0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41
0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38
1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38
1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38

1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38
1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38
2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38
2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
2.933	2.07	5.933	90.91	8.933	2.41	11.93	1.38
2.950	2.07	5.950	90.91	8.950	2.41	11.95	1.38
2.967	2.07	5.967	90.91	8.967	2.41	11.97	1.38
2.983	2.07	5.983	90.91	8.983	2.41	11.98	1.38
3.000	2.07	6.000	90.80	9.000	2.41	12.00	1.38

```
     Max.Eff.Inten.(mm/hr)=      90.91        25.53
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       2.78 (ii)    9.56 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.04          0.255 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.08           6.00
     RUNOFF VOLUME    (mm)=      67.86        13.45          41.20
     TOTAL RAINFALL   (mm)=      68.87        68.87          68.87
     RUNOFF COEFFICIENT   =       0.99         0.20           0.60


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0026):     0.27   0.033     6.00    24.91
      + ID2= 2 (  0007):     1.75   0.255     6.00    41.20
        ================================================
        ID = 3 (  0018):     2.02   0.289     6.00    39.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0009)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0007   |   0.0212      0.0291
                          0.0037     0.0045   |   0.0402      0.0316
                          0.0053     0.0065   |   0.1203      0.0341
                          0.0081     0.0128   |   0.2476      0.0366
                          0.0101     0.0188   |   0.3901      0.0373
                          0.0118     0.0250   |   0.4841      0.0381
                          0.0126     0.0279   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020      0.289      6.00      39.02
   OUTFLOW: ID= 1 (  0009)      2.020      0.194      6.07      38.55

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 67.22
                  TIME SHIFT OF PEAK FLOW         (min)=  4.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0355

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.95

         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    1.72 | 3.017    2.75 | 6.017   12.40 |  9.02    2.41
               0.033    1.72 | 3.033    2.75 | 6.033   12.40 |  9.03    2.41
               0.050    1.72 | 3.050    2.75 | 6.050   12.40 |  9.05    2.41
               0.067    1.72 | 3.067    2.75 | 6.067   12.40 |  9.07    2.41
               0.083    1.72 | 3.083    2.75 | 6.083   12.40 |  9.08    2.41
               0.100    1.72 | 3.100    2.75 | 6.100   12.40 |  9.10    2.41
               0.117    1.72 | 3.117    2.75 | 6.117   12.40 |  9.12    2.41
               0.133    1.72 | 3.133    2.75 | 6.133   12.40 |  9.13    2.41
               0.150    1.72 | 3.150    2.75 | 6.150   12.40 |  9.15    2.41
               0.167    1.72 | 3.167    2.75 | 6.167   12.40 |  9.17    2.41
               0.183    1.72 | 3.183    2.75 | 6.183   12.40 |  9.18    2.41
```

0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41
0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41
0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41
0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38
1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38

1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38
1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38
1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38
2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38
2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38

2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
2.933	2.07	5.933	90.91	8.933	2.41	11.93	1.38
2.950	2.07	5.950	90.91	8.950	2.41	11.95	1.38
2.967	2.07	5.967	90.91	8.967	2.41	11.97	1.38
2.983	2.07	5.983	90.91	8.983	2.41	11.98	1.38
3.000	2.07	6.000	90.80	9.000	2.41	12.00	1.38

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.271 (i)
TIME TO PEAK (hrs)= 6.983
RUNOFF VOLUME (mm)= 17.737
TOTAL RAINFALL (mm)= 68.867
RUNOFF COEFFICIENT = 0.258

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

CALIB
STANDHYD (0006) | Area (ha)= 0.75
ID= 1 DT= 1.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	1.72	3.017	2.75	6.017	12.40	9.02	2.41
0.033	1.72	3.033	2.75	6.033	12.40	9.03	2.41
0.050	1.72	3.050	2.75	6.050	12.40	9.05	2.41
0.067	1.72	3.067	2.75	6.067	12.40	9.07	2.41
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.100	1.72	3.100	2.75	6.100	12.40	9.10	2.41
0.117	1.72	3.117	2.75	6.117	12.40	9.12	2.41
0.133	1.72	3.133	2.75	6.133	12.40	9.13	2.41
0.150	1.72	3.150	2.75	6.150	12.40	9.15	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.183	1.72	3.183	2.75	6.183	12.40	9.18	2.41
0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41
0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41
0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41
0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41

0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38
1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38
1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38
1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38
1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38

1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38
2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38
2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
2.933	2.07	5.933	90.91	8.933	2.41	11.93	1.38
2.950	2.07	5.950	90.91	8.950	2.41	11.95	1.38
2.967	2.07	5.967	90.91	8.967	2.41	11.97	1.38
2.983	2.07	5.983	90.91	8.983	2.41	11.98	1.38
3.000	2.07	6.000	90.80	9.000	2.41	12.00	1.38

Max.Eff.Inten.(mm/hr)=	90.91	106.58	
over (min)	5.00	6.00	
Storage Coeff. (min)=	2.16 (ii)	5.45 (ii)	
Unit Hyd. Tpeak (min)=	5.00	6.00	
Unit Hyd. peak (cms)=	0.36	0.20	
			TOTALS
PEAK FLOW (cms)=	0.14	0.02	0.159 (iii)
TIME TO PEAK (hrs)=	6.00	6.02	6.00
RUNOFF VOLUME (mm)=	67.87	25.30	56.80
TOTAL RAINFALL (mm)=	68.87	68.87	68.87
RUNOFF COEFFICIENT =	0.99	0.37	0.82

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0011) 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	0.0912	0.0179
	0.0006	0.0005	0.1027	0.0204
	0.0062	0.0056	0.1264	0.0248
	0.0100	0.0060	0.1349	0.0263
	0.0470	0.0101	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0006)	0.750	0.159	6.00	56.80
OUTFLOW: ID= 1 (0011)	0.750	0.082	6.08	56.52

PEAK FLOW REDUCTION [Qout/Qin](%)= 51.24
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0162

CALIB STANDHYD (0008) ID= 1 DT= 1.0 min	Area (ha)= 2.20 Total Imp(%)= 59.00 Dir. Conn.(%)= 45.00		
		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.30	0.90
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	121.11	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	1.72	3.017	2.75	6.017	12.40	9.02	2.41
0.033	1.72	3.033	2.75	6.033	12.40	9.03	2.41
0.050	1.72	3.050	2.75	6.050	12.40	9.05	2.41
0.067	1.72	3.067	2.75	6.067	12.40	9.07	2.41
0.083	1.72	3.083	2.75	6.083	12.40	9.08	2.41
0.100	1.72	3.100	2.75	6.100	12.40	9.10	2.41
0.117	1.72	3.117	2.75	6.117	12.40	9.12	2.41
0.133	1.72	3.133	2.75	6.133	12.40	9.13	2.41
0.150	1.72	3.150	2.75	6.150	12.40	9.15	2.41
0.167	1.72	3.167	2.75	6.167	12.40	9.17	2.41
0.183	1.72	3.183	2.75	6.183	12.40	9.18	2.41
0.200	1.72	3.200	2.75	6.200	12.40	9.20	2.41
0.217	1.72	3.217	2.75	6.217	12.40	9.22	2.41
0.233	1.72	3.233	2.75	6.233	12.40	9.23	2.41
0.250	1.72	3.250	2.75	6.250	12.40	9.25	2.41
0.267	1.72	3.267	2.75	6.267	12.40	9.27	2.41
0.283	1.72	3.283	2.75	6.283	12.40	9.28	2.41
0.300	1.72	3.300	2.75	6.300	12.40	9.30	2.41
0.317	1.72	3.317	2.75	6.317	12.40	9.32	2.41
0.333	1.72	3.333	2.75	6.333	12.40	9.33	2.41
0.350	1.72	3.350	2.75	6.350	12.40	9.35	2.41
0.367	1.72	3.367	2.75	6.367	12.40	9.37	2.41
0.383	1.72	3.383	2.75	6.383	12.40	9.38	2.41
0.400	1.72	3.400	2.75	6.400	12.40	9.40	2.41
0.417	1.72	3.417	2.75	6.417	12.40	9.42	2.41
0.433	1.72	3.433	2.75	6.433	12.40	9.43	2.41
0.450	1.72	3.450	2.75	6.450	12.40	9.45	2.41
0.467	1.72	3.467	2.75	6.467	12.40	9.47	2.41
0.483	1.72	3.483	2.75	6.483	12.40	9.48	2.41
0.500	1.72	3.500	2.75	6.500	12.39	9.50	2.41
0.517	1.72	3.517	2.75	6.517	5.51	9.52	2.41
0.533	1.72	3.533	2.75	6.533	5.51	9.53	2.41
0.550	1.72	3.550	2.75	6.550	5.51	9.55	2.41
0.567	1.72	3.567	2.75	6.567	5.51	9.57	2.41
0.583	1.72	3.583	2.75	6.583	5.51	9.58	2.41

0.600	1.72	3.600	2.75	6.600	5.51	9.60	2.41
0.617	1.72	3.617	2.75	6.617	5.51	9.62	2.41
0.633	1.72	3.633	2.75	6.633	5.51	9.63	2.41
0.650	1.72	3.650	2.75	6.650	5.51	9.65	2.41
0.667	1.72	3.667	2.75	6.667	5.51	9.67	2.41
0.683	1.72	3.683	2.75	6.683	5.51	9.68	2.41
0.700	1.72	3.700	2.75	6.700	5.51	9.70	2.41
0.717	1.72	3.717	2.75	6.717	5.51	9.72	2.41
0.733	1.72	3.733	2.75	6.733	5.51	9.73	2.41
0.750	1.72	3.750	2.75	6.750	5.51	9.75	2.41
0.767	1.72	3.767	2.75	6.767	5.51	9.77	2.41
0.783	1.72	3.783	2.75	6.783	5.51	9.78	2.41
0.800	1.72	3.800	2.75	6.800	5.51	9.80	2.41
0.817	1.72	3.817	2.75	6.817	5.51	9.82	2.41
0.833	1.72	3.833	2.75	6.833	5.51	9.83	2.41
0.850	1.72	3.850	2.75	6.850	5.51	9.85	2.41
0.867	1.72	3.867	2.75	6.867	5.51	9.87	2.41
0.883	1.72	3.883	2.75	6.883	5.51	9.88	2.41
0.900	1.72	3.900	2.75	6.900	5.51	9.90	2.41
0.917	1.72	3.917	2.75	6.917	5.51	9.92	2.41
0.933	1.72	3.933	2.75	6.933	5.51	9.93	2.41
0.950	1.72	3.950	2.75	6.950	5.51	9.95	2.41
0.967	1.72	3.967	2.75	6.967	5.51	9.97	2.41
0.983	1.72	3.983	2.75	6.983	5.51	9.98	2.41
1.000	1.72	4.000	2.75	7.000	5.51	10.00	2.41
1.017	1.72	4.017	4.13	7.017	4.13	10.02	1.38
1.033	1.72	4.033	4.13	7.033	4.13	10.03	1.38
1.050	1.72	4.050	4.13	7.050	4.13	10.05	1.38
1.067	1.72	4.067	4.13	7.067	4.13	10.07	1.38
1.083	1.72	4.083	4.13	7.083	4.13	10.08	1.38
1.100	1.72	4.100	4.13	7.100	4.13	10.10	1.38
1.117	1.72	4.117	4.13	7.117	4.13	10.12	1.38
1.133	1.72	4.133	4.13	7.133	4.13	10.13	1.38
1.150	1.72	4.150	4.13	7.150	4.13	10.15	1.38
1.167	1.72	4.167	4.13	7.167	4.13	10.17	1.38
1.183	1.72	4.183	4.13	7.183	4.13	10.18	1.38
1.200	1.72	4.200	4.13	7.200	4.13	10.20	1.38
1.217	1.72	4.217	4.13	7.217	4.13	10.22	1.38
1.233	1.72	4.233	4.13	7.233	4.13	10.23	1.38
1.250	1.72	4.250	4.13	7.250	4.13	10.25	1.38
1.267	1.72	4.267	4.13	7.267	4.13	10.27	1.38
1.283	1.72	4.283	4.13	7.283	4.13	10.28	1.38
1.300	1.72	4.300	4.13	7.300	4.13	10.30	1.38
1.317	1.72	4.317	4.13	7.317	4.13	10.32	1.38
1.333	1.72	4.333	4.13	7.333	4.13	10.33	1.38
1.350	1.72	4.350	4.13	7.350	4.13	10.35	1.38
1.367	1.72	4.367	4.13	7.367	4.13	10.37	1.38
1.383	1.72	4.383	4.13	7.383	4.13	10.38	1.38
1.400	1.72	4.400	4.13	7.400	4.13	10.40	1.38
1.417	1.72	4.417	4.13	7.417	4.13	10.42	1.38
1.433	1.72	4.433	4.13	7.433	4.13	10.43	1.38
1.450	1.72	4.450	4.13	7.450	4.13	10.45	1.38
1.467	1.72	4.467	4.13	7.467	4.13	10.47	1.38
1.483	1.72	4.483	4.13	7.483	4.13	10.48	1.38
1.500	1.72	4.500	4.13	7.500	4.13	10.50	1.38
1.517	1.72	4.517	5.51	7.517	4.13	10.52	1.38
1.533	1.72	4.533	5.51	7.533	4.13	10.53	1.38
1.550	1.72	4.550	5.51	7.550	4.13	10.55	1.38
1.567	1.72	4.567	5.51	7.567	4.13	10.57	1.38
1.583	1.72	4.583	5.51	7.583	4.13	10.58	1.38
1.600	1.72	4.600	5.51	7.600	4.13	10.60	1.38
1.617	1.72	4.617	5.51	7.617	4.13	10.62	1.38
1.633	1.72	4.633	5.51	7.633	4.13	10.63	1.38
1.650	1.72	4.650	5.51	7.650	4.13	10.65	1.38
1.667	1.72	4.667	5.51	7.667	4.13	10.67	1.38
1.683	1.72	4.683	5.51	7.683	4.13	10.68	1.38
1.700	1.72	4.700	5.51	7.700	4.13	10.70	1.38
1.717	1.72	4.717	5.51	7.717	4.13	10.72	1.38
1.733	1.72	4.733	5.51	7.733	4.13	10.73	1.38
1.750	1.72	4.750	5.51	7.750	4.13	10.75	1.38
1.767	1.72	4.767	5.51	7.767	4.13	10.77	1.38
1.783	1.72	4.783	5.51	7.783	4.13	10.78	1.38
1.800	1.72	4.800	5.51	7.800	4.13	10.80	1.38
1.817	1.72	4.817	5.51	7.817	4.13	10.82	1.38
1.833	1.72	4.833	5.51	7.833	4.13	10.83	1.38
1.850	1.72	4.850	5.51	7.850	4.13	10.85	1.38
1.867	1.72	4.867	5.51	7.867	4.13	10.87	1.38
1.883	1.72	4.883	5.51	7.883	4.13	10.88	1.38
1.900	1.72	4.900	5.51	7.900	4.13	10.90	1.38

1.917	1.72	4.917	5.51	7.917	4.13	10.92	1.38
1.933	1.72	4.933	5.51	7.933	4.13	10.93	1.38
1.950	1.72	4.950	5.51	7.950	4.13	10.95	1.38
1.967	1.72	4.967	5.51	7.967	4.13	10.97	1.38
1.983	1.72	4.983	5.51	7.983	4.13	10.98	1.38
2.000	1.72	5.000	5.51	8.000	4.12	11.00	1.38
2.017	2.07	5.017	8.26	8.017	2.41	11.02	1.38
2.033	2.07	5.033	8.26	8.033	2.41	11.03	1.38
2.050	2.07	5.050	8.26	8.050	2.41	11.05	1.38
2.067	2.07	5.067	8.26	8.067	2.41	11.07	1.38
2.083	2.07	5.083	8.26	8.083	2.41	11.08	1.38
2.100	2.07	5.100	8.26	8.100	2.41	11.10	1.38
2.117	2.07	5.117	8.26	8.117	2.41	11.12	1.38
2.133	2.07	5.133	8.26	8.133	2.41	11.13	1.38
2.150	2.07	5.150	8.26	8.150	2.41	11.15	1.38
2.167	2.07	5.167	8.26	8.167	2.41	11.17	1.38
2.183	2.07	5.183	8.26	8.183	2.41	11.18	1.38
2.200	2.07	5.200	8.26	8.200	2.41	11.20	1.38
2.217	2.07	5.217	8.26	8.217	2.41	11.22	1.38
2.233	2.07	5.233	8.26	8.233	2.41	11.23	1.38
2.250	2.07	5.250	8.26	8.250	2.41	11.25	1.38
2.267	2.07	5.267	8.26	8.267	2.41	11.27	1.38
2.283	2.07	5.283	8.26	8.283	2.41	11.28	1.38
2.300	2.07	5.300	8.26	8.300	2.41	11.30	1.38
2.317	2.07	5.317	8.26	8.317	2.41	11.32	1.38
2.333	2.07	5.333	8.26	8.333	2.41	11.33	1.38
2.350	2.07	5.350	8.26	8.350	2.41	11.35	1.38
2.367	2.07	5.367	8.26	8.367	2.41	11.37	1.38
2.383	2.07	5.383	8.26	8.383	2.41	11.38	1.38
2.400	2.07	5.400	8.26	8.400	2.41	11.40	1.38
2.417	2.07	5.417	8.26	8.417	2.41	11.42	1.38
2.433	2.07	5.433	8.26	8.433	2.41	11.43	1.38
2.450	2.07	5.450	8.26	8.450	2.41	11.45	1.38
2.467	2.07	5.467	8.26	8.467	2.41	11.47	1.38
2.483	2.07	5.483	8.26	8.483	2.41	11.48	1.38
2.500	2.07	5.500	8.28	8.500	2.41	11.50	1.38
2.517	2.07	5.517	33.06	8.517	2.41	11.52	1.38
2.533	2.07	5.533	33.06	8.533	2.41	11.53	1.38
2.550	2.07	5.550	33.06	8.550	2.41	11.55	1.38
2.567	2.07	5.567	33.06	8.567	2.41	11.57	1.38
2.583	2.07	5.583	33.06	8.583	2.41	11.58	1.38
2.600	2.07	5.600	33.06	8.600	2.41	11.60	1.38
2.617	2.07	5.617	33.06	8.617	2.41	11.62	1.38
2.633	2.07	5.633	33.06	8.633	2.41	11.63	1.38
2.650	2.07	5.650	33.06	8.650	2.41	11.65	1.38
2.667	2.07	5.667	33.06	8.667	2.41	11.67	1.38
2.683	2.07	5.683	33.06	8.683	2.41	11.68	1.38
2.700	2.07	5.700	33.06	8.700	2.41	11.70	1.38
2.717	2.07	5.717	33.06	8.717	2.41	11.72	1.38
2.733	2.07	5.733	33.06	8.733	2.41	11.73	1.38
2.750	2.07	5.750	33.13	8.750	2.41	11.75	1.38
2.767	2.07	5.767	90.91	8.767	2.41	11.77	1.38
2.783	2.07	5.783	90.91	8.783	2.41	11.78	1.38
2.800	2.07	5.800	90.91	8.800	2.41	11.80	1.38
2.817	2.07	5.817	90.91	8.817	2.41	11.82	1.38
2.833	2.07	5.833	90.91	8.833	2.41	11.83	1.38
2.850	2.07	5.850	90.91	8.850	2.41	11.85	1.38
2.867	2.07	5.867	90.91	8.867	2.41	11.87	1.38
2.883	2.07	5.883	90.91	8.883	2.41	11.88	1.38
2.900	2.07	5.900	90.91	8.900	2.41	11.90	1.38
2.917	2.07	5.917	90.91	8.917	2.41	11.92	1.38
2.933	2.07	5.933	90.91	8.933	2.41	11.93	1.38
2.950	2.07	5.950	90.91	8.950	2.41	11.95	1.38
2.967	2.07	5.967	90.91	8.967	2.41	11.97	1.38
2.983	2.07	5.983	90.91	8.983	2.41	11.98	1.38
3.000	2.07	6.000	90.80	9.000	2.41	12.00	1.38

Max.Eff.Inten.(mm/hr)=	90.91	33.21	
over (min)	5.00	11.00	
Storage Coeff. (min)=	2.98 (ii)	10.04 (ii)	
Unit Hyd. Tpeak (min)=	5.00	11.00	
Unit Hyd. peak (cms)=	0.31	0.11	
			TOTALS
PEAK FLOW (cms)=	0.25	0.06	0.295 (iii)
TIME TO PEAK (hrs)=	6.00	6.08	6.00
RUNOFF VOLUME (mm)=	67.87	15.23	38.91
TOTAL RAINFALL (mm)=	68.87	68.87	68.87
RUNOFF COEFFICIENT =	0.99	0.22	0.57

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0010)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0570      0.0442
                          0.0008     0.0012   |   0.0640      0.0503
                          0.0063     0.0138   |   0.0780      0.0611
                          0.0090     0.0149   |   0.0830      0.0649
                          0.0320     0.0249   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0008)      2.200      0.295      6.00      38.91
   OUTFLOW: ID= 1 (  0010)      2.200      0.058      6.38      38.74

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 19.53
                  TIME SHIFT OF PEAK FLOW         (min)= 23.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0448

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0039)|   Area    (ha)=   0.08
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.04
     Dep. Storage     (mm)=       1.00         2.30
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      23.09        40.00
     Mannings n             =     0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.083    1.72 | 3.083    2.75 | 6.083   12.40 |  9.08    2.41
 0.167    1.72 | 3.167    2.75 | 6.167   12.40 |  9.17    2.41
 0.250    1.72 | 3.250    2.75 | 6.250   12.40 |  9.25    2.41
 0.333    1.72 | 3.333    2.75 | 6.333   12.40 |  9.33    2.41
 0.417    1.72 | 3.417    2.75 | 6.417   12.40 |  9.42    2.41
 0.500    1.72 | 3.500    2.75 | 6.500   12.40 |  9.50    2.41
 0.583    1.72 | 3.583    2.75 | 6.583    5.51 |  9.58    2.41
 0.667    1.72 | 3.667    2.75 | 6.667    5.51 |  9.67    2.41
 0.750    1.72 | 3.750    2.75 | 6.750    5.51 |  9.75    2.41
 0.833    1.72 | 3.833    2.75 | 6.833    5.51 |  9.83    2.41
 0.917    1.72 | 3.917    2.75 | 6.917    5.51 |  9.92    2.41
 1.000    1.72 | 4.000    2.75 | 7.000    5.51 | 10.00    2.41
 1.083    1.72 | 4.083    4.13 | 7.083    4.13 | 10.08    1.38
 1.167    1.72 | 4.167    4.13 | 7.167    4.13 | 10.17    1.38
 1.250    1.72 | 4.250    4.13 | 7.250    4.13 | 10.25    1.38
 1.333    1.72 | 4.333    4.13 | 7.333    4.13 | 10.33    1.38
 1.417    1.72 | 4.417    4.13 | 7.417    4.13 | 10.42    1.38
 1.500    1.72 | 4.500    4.13 | 7.500    4.13 | 10.50    1.38
 1.583    1.72 | 4.583    5.51 | 7.583    4.13 | 10.58    1.38
 1.667    1.72 | 4.667    5.51 | 7.667    4.13 | 10.67    1.38
 1.750    1.72 | 4.750    5.51 | 7.750    4.13 | 10.75    1.38
 1.833    1.72 | 4.833    5.51 | 7.833    4.13 | 10.83    1.38
 1.917    1.72 | 4.917    5.51 | 7.917    4.13 | 10.92    1.38
 2.000    1.72 | 5.000    5.51 | 8.000    4.13 | 11.00    1.38
 2.083    2.07 | 5.083    8.26 | 8.083    2.41 | 11.08    1.38
 2.167    2.07 | 5.167    8.26 | 8.167    2.41 | 11.17    1.38
 2.250    2.07 | 5.250    8.26 | 8.250    2.41 | 11.25    1.38
 2.333    2.07 | 5.333    8.26 | 8.333    2.41 | 11.33    1.38
 2.417    2.07 | 5.417    8.26 | 8.417    2.41 | 11.42    1.38
 2.500    2.07 | 5.500    8.26 | 8.500    2.41 | 11.50    1.38
 2.583    2.07 | 5.583   33.06 | 8.583    2.41 | 11.58    1.38
 2.667    2.07 | 5.667   33.06 | 8.667    2.41 | 11.67    1.38
```

```
               2.750    2.07 | 5.750   33.06 | 8.750    2.41 | 11.75    1.38
               2.833    2.07 | 5.833   90.91 | 8.833    2.41 | 11.83    1.38
               2.917    2.07 | 5.917   90.91 | 8.917    2.41 | 11.92    1.38
               3.000    2.07 | 6.000   90.91 | 9.000    2.41 | 12.00    1.38

     Max.Eff.Inten.(mm/hr)=      90.91       111.05
               over (min)        5.00        10.00
     Storage Coeff.  (min)=      1.10 (ii)    7.87 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.34         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.01         0.01          0.017 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=     67.87        56.58          60.47
     TOTAL RAINFALL   (mm)=     68.87        68.87          68.87
     RUNOFF COEFFICIENT   =      0.99         0.82           0.88

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  94.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.20   0.058     6.38    38.74
     + ID2= 2 (  0011):     0.75   0.082     6.08    56.52
       ================================================
       ID = 3 (  0004):     2.95   0.135     6.10    43.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):     2.95   0.135     6.10    43.26
     + ID2= 2 (  0027):    16.11   0.271     6.98    17.74
       ================================================
       ID = 1 (  0004):    19.06   0.347     6.83    21.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    19.06   0.347     6.83    21.69
     + ID2= 2 (  0003):     4.63   0.018    10.07    24.79
       ================================================
       ID = 3 (  0004):    23.69   0.363     6.85    22.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):    23.69   0.363     6.85    22.29
     + ID2= 2 (  0039):     0.08   0.017     6.00    60.47
       ================================================
       ID = 1 (  0004):    23.77   0.364     6.85    22.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
       ID1= 1 (  0004):    23.77   0.364     6.85    22.42
     + ID2= 2 (  0009):     2.02   0.194     6.07    38.55
       ================================================
       ID = 3 (  0004):    25.79   0.425     6.08    23.68

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  ***********************************************
  ** SIMULATION : Run 10                       **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\pcallaghan\AppD
|                  |              ata\Local\Temp\
|                  |              d1c59b48-457d-442d-8825-8b87b5d6c641\c37e24c1
| Ptotal= 79.86 mm |    Comments: 25-Year 12-Hour SCS II Design Storm
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.00	3.25	3.19	6.25	14.37	9.25	2.80
0.50	2.00	3.50	3.19	6.50	14.37	9.50	2.80
0.75	2.00	3.75	3.19	6.75	6.39	9.75	2.80
1.00	2.00	4.00	3.19	7.00	6.39	10.00	2.80
1.25	2.00	4.25	4.79	7.25	4.79	10.25	1.60
1.50	2.00	4.50	4.79	7.50	4.79	10.50	1.60
1.75	2.00	4.75	6.39	7.75	4.79	10.75	1.60
2.00	2.00	5.00	6.39	8.00	4.79	11.00	1.60
2.25	2.40	5.25	9.58	8.25	2.80	11.25	1.60
2.50	2.40	5.50	9.58	8.50	2.80	11.50	1.60
2.75	2.40	5.75	38.33	8.75	2.80	11.75	1.60
3.00	2.40	6.00	105.42	9.00	2.80	12.00	1.60

```
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

         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	2.00	3.017	3.19	6.017	14.37	9.02	2.80
0.033	2.00	3.033	3.19	6.033	14.37	9.03	2.80
0.050	2.00	3.050	3.19	6.050	14.37	9.05	2.80
0.067	2.00	3.067	3.19	6.067	14.37	9.07	2.80
0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.100	2.00	3.100	3.19	6.100	14.37	9.10	2.80
0.117	2.00	3.117	3.19	6.117	14.37	9.12	2.80
0.133	2.00	3.133	3.19	6.133	14.37	9.13	2.80
0.150	2.00	3.150	3.19	6.150	14.37	9.15	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.183	2.00	3.183	3.19	6.183	14.37	9.18	2.80
0.200	2.00	3.200	3.19	6.200	14.37	9.20	2.80
0.217	2.00	3.217	3.19	6.217	14.37	9.22	2.80
0.233	2.00	3.233	3.19	6.233	14.37	9.23	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.267	2.00	3.267	3.19	6.267	14.37	9.27	2.80
0.283	2.00	3.283	3.19	6.283	14.37	9.28	2.80
0.300	2.00	3.300	3.19	6.300	14.37	9.30	2.80
0.317	2.00	3.317	3.19	6.317	14.37	9.32	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.350	2.00	3.350	3.19	6.350	14.37	9.35	2.80
0.367	2.00	3.367	3.19	6.367	14.37	9.37	2.80
0.383	2.00	3.383	3.19	6.383	14.37	9.38	2.80
0.400	2.00	3.400	3.19	6.400	14.37	9.40	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.433	2.00	3.433	3.19	6.433	14.37	9.43	2.80
0.450	2.00	3.450	3.19	6.450	14.37	9.45	2.80
0.467	2.00	3.467	3.19	6.467	14.37	9.47	2.80
0.483	2.00	3.483	3.19	6.483	14.37	9.48	2.80
0.500	2.00	3.500	3.19	6.500	14.36	9.50	2.80
0.517	2.00	3.517	3.19	6.517	6.39	9.52	2.80
0.533	2.00	3.533	3.19	6.533	6.39	9.53	2.80

0.550	2.00	3.550	3.19	6.550	6.39	9.55	2.80
0.567	2.00	3.567	3.19	6.567	6.39	9.57	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.600	2.00	3.600	3.19	6.600	6.39	9.60	2.80
0.617	2.00	3.617	3.19	6.617	6.39	9.62	2.80
0.633	2.00	3.633	3.19	6.633	6.39	9.63	2.80
0.650	2.00	3.650	3.19	6.650	6.39	9.65	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.683	2.00	3.683	3.19	6.683	6.39	9.68	2.80
0.700	2.00	3.700	3.19	6.700	6.39	9.70	2.80
0.717	2.00	3.717	3.19	6.717	6.39	9.72	2.80
0.733	2.00	3.733	3.19	6.733	6.39	9.73	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.767	2.00	3.767	3.19	6.767	6.39	9.77	2.80
0.783	2.00	3.783	3.19	6.783	6.39	9.78	2.80
0.800	2.00	3.800	3.19	6.800	6.39	9.80	2.80
0.817	2.00	3.817	3.19	6.817	6.39	9.82	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.850	2.00	3.850	3.19	6.850	6.39	9.85	2.80
0.867	2.00	3.867	3.19	6.867	6.39	9.87	2.80
0.883	2.00	3.883	3.19	6.883	6.39	9.88	2.80
0.900	2.00	3.900	3.19	6.900	6.39	9.90	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
0.933	2.00	3.933	3.19	6.933	6.39	9.93	2.80
0.950	2.00	3.950	3.19	6.950	6.39	9.95	2.80
0.967	2.00	3.967	3.19	6.967	6.39	9.97	2.80
0.983	2.00	3.983	3.19	6.983	6.39	9.98	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60
1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60
1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60
1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60
1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60

1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60
2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60
2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60
2.617	2.40	5.617	38.33	8.617	2.80	11.62	1.60
2.633	2.40	5.633	38.33	8.633	2.80	11.63	1.60
2.650	2.40	5.650	38.33	8.650	2.80	11.65	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.683	2.40	5.683	38.33	8.683	2.80	11.68	1.60
2.700	2.40	5.700	38.33	8.700	2.80	11.70	1.60
2.717	2.40	5.717	38.33	8.717	2.80	11.72	1.60
2.733	2.40	5.733	38.33	8.733	2.80	11.73	1.60
2.750	2.40	5.750	38.41	8.750	2.80	11.75	1.60
2.767	2.40	5.767	105.42	8.767	2.80	11.77	1.60
2.783	2.40	5.783	105.42	8.783	2.80	11.78	1.60
2.800	2.40	5.800	105.42	8.800	2.80	11.80	1.60
2.817	2.40	5.817	105.42	8.817	2.80	11.82	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.850	2.40	5.850	105.42	8.850	2.80	11.85	1.60
2.867	2.40	5.867	105.42	8.867	2.80	11.87	1.60
2.883	2.40	5.883	105.42	8.883	2.80	11.88	1.60
2.900	2.40	5.900	105.42	8.900	2.80	11.90	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60
2.933	2.40	5.933	105.42	8.933	2.80	11.93	1.60
2.950	2.40	5.950	105.42	8.950	2.80	11.95	1.60
2.967	2.40	5.967	105.42	8.967	2.80	11.97	1.60
2.983	2.40	5.983	105.42	8.983	2.80	11.98	1.60
3.000	2.40	6.000	105.29	9.000	2.80	12.00	1.60

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.081 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 28.024
TOTAL RAINFALL (mm)= 79.859
RUNOFF COEFFICIENT = 0.351

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=   2.91
|ID= 1 DT= 1.0 min |   Total Imp(%)=  56.00   Dir. Conn.(%)=  51.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.63         1.28
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.50         3.00
     Length            (m)=     139.28        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    2.00 | 3.017    3.19 | 6.017   14.37 |  9.02    2.80
 0.033    2.00 | 3.033    3.19 | 6.033   14.37 |  9.03    2.80
 0.050    2.00 | 3.050    3.19 | 6.050   14.37 |  9.05    2.80
 0.067    2.00 | 3.067    3.19 | 6.067   14.37 |  9.07    2.80
 0.083    2.00 | 3.083    3.19 | 6.083   14.37 |  9.08    2.80
 0.100    2.00 | 3.100    3.19 | 6.100   14.37 |  9.10    2.80
 0.117    2.00 | 3.117    3.19 | 6.117   14.37 |  9.12    2.80
 0.133    2.00 | 3.133    3.19 | 6.133   14.37 |  9.13    2.80
 0.150    2.00 | 3.150    3.19 | 6.150   14.37 |  9.15    2.80
 0.167    2.00 | 3.167    3.19 | 6.167   14.37 |  9.17    2.80
 0.183    2.00 | 3.183    3.19 | 6.183   14.37 |  9.18    2.80
 0.200    2.00 | 3.200    3.19 | 6.200   14.37 |  9.20    2.80
 0.217    2.00 | 3.217    3.19 | 6.217   14.37 |  9.22    2.80
 0.233    2.00 | 3.233    3.19 | 6.233   14.37 |  9.23    2.80
 0.250    2.00 | 3.250    3.19 | 6.250   14.37 |  9.25    2.80
 0.267    2.00 | 3.267    3.19 | 6.267   14.37 |  9.27    2.80
 0.283    2.00 | 3.283    3.19 | 6.283   14.37 |  9.28    2.80
 0.300    2.00 | 3.300    3.19 | 6.300   14.37 |  9.30    2.80
 0.317    2.00 | 3.317    3.19 | 6.317   14.37 |  9.32    2.80
 0.333    2.00 | 3.333    3.19 | 6.333   14.37 |  9.33    2.80
 0.350    2.00 | 3.350    3.19 | 6.350   14.37 |  9.35    2.80
 0.367    2.00 | 3.367    3.19 | 6.367   14.37 |  9.37    2.80
 0.383    2.00 | 3.383    3.19 | 6.383   14.37 |  9.38    2.80
 0.400    2.00 | 3.400    3.19 | 6.400   14.37 |  9.40    2.80
 0.417    2.00 | 3.417    3.19 | 6.417   14.37 |  9.42    2.80
 0.433    2.00 | 3.433    3.19 | 6.433   14.37 |  9.43    2.80
 0.450    2.00 | 3.450    3.19 | 6.450   14.37 |  9.45    2.80
 0.467    2.00 | 3.467    3.19 | 6.467   14.37 |  9.47    2.80
 0.483    2.00 | 3.483    3.19 | 6.483   14.37 |  9.48    2.80
 0.500    2.00 | 3.500    3.19 | 6.500   14.36 |  9.50    2.80
 0.517    2.00 | 3.517    3.19 | 6.517    6.39 |  9.52    2.80
 0.533    2.00 | 3.533    3.19 | 6.533    6.39 |  9.53    2.80
 0.550    2.00 | 3.550    3.19 | 6.550    6.39 |  9.55    2.80
 0.567    2.00 | 3.567    3.19 | 6.567    6.39 |  9.57    2.80
 0.583    2.00 | 3.583    3.19 | 6.583    6.39 |  9.58    2.80
 0.600    2.00 | 3.600    3.19 | 6.600    6.39 |  9.60    2.80
 0.617    2.00 | 3.617    3.19 | 6.617    6.39 |  9.62    2.80
 0.633    2.00 | 3.633    3.19 | 6.633    6.39 |  9.63    2.80
 0.650    2.00 | 3.650    3.19 | 6.650    6.39 |  9.65    2.80
 0.667    2.00 | 3.667    3.19 | 6.667    6.39 |  9.67    2.80
 0.683    2.00 | 3.683    3.19 | 6.683    6.39 |  9.68    2.80
 0.700    2.00 | 3.700    3.19 | 6.700    6.39 |  9.70    2.80
 0.717    2.00 | 3.717    3.19 | 6.717    6.39 |  9.72    2.80
 0.733    2.00 | 3.733    3.19 | 6.733    6.39 |  9.73    2.80
 0.750    2.00 | 3.750    3.19 | 6.750    6.39 |  9.75    2.80
 0.767    2.00 | 3.767    3.19 | 6.767    6.39 |  9.77    2.80
 0.783    2.00 | 3.783    3.19 | 6.783    6.39 |  9.78    2.80
 0.800    2.00 | 3.800    3.19 | 6.800    6.39 |  9.80    2.80
 0.817    2.00 | 3.817    3.19 | 6.817    6.39 |  9.82    2.80
 0.833    2.00 | 3.833    3.19 | 6.833    6.39 |  9.83    2.80
 0.850    2.00 | 3.850    3.19 | 6.850    6.39 |  9.85    2.80
 0.867    2.00 | 3.867    3.19 | 6.867    6.39 |  9.87    2.80
 0.883    2.00 | 3.883    3.19 | 6.883    6.39 |  9.88    2.80
 0.900    2.00 | 3.900    3.19 | 6.900    6.39 |  9.90    2.80
 0.917    2.00 | 3.917    3.19 | 6.917    6.39 |  9.92    2.80
 0.933    2.00 | 3.933    3.19 | 6.933    6.39 |  9.93    2.80
 0.950    2.00 | 3.950    3.19 | 6.950    6.39 |  9.95    2.80
 0.967    2.00 | 3.967    3.19 | 6.967    6.39 |  9.97    2.80
 0.983    2.00 | 3.983    3.19 | 6.983    6.39 |  9.98    2.80
```

1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60
1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60
1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60
1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60
1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60
1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60

2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60
2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60
2.617	2.40	5.617	38.33	8.617	2.80	11.62	1.60
2.633	2.40	5.633	38.33	8.633	2.80	11.63	1.60
2.650	2.40	5.650	38.33	8.650	2.80	11.65	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.683	2.40	5.683	38.33	8.683	2.80	11.68	1.60
2.700	2.40	5.700	38.33	8.700	2.80	11.70	1.60
2.717	2.40	5.717	38.33	8.717	2.80	11.72	1.60
2.733	2.40	5.733	38.33	8.733	2.80	11.73	1.60
2.750	2.40	5.750	38.41	8.750	2.80	11.75	1.60
2.767	2.40	5.767	105.42	8.767	2.80	11.77	1.60
2.783	2.40	5.783	105.42	8.783	2.80	11.78	1.60
2.800	2.40	5.800	105.42	8.800	2.80	11.80	1.60
2.817	2.40	5.817	105.42	8.817	2.80	11.82	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.850	2.40	5.850	105.42	8.850	2.80	11.85	1.60
2.867	2.40	5.867	105.42	8.867	2.80	11.87	1.60
2.883	2.40	5.883	105.42	8.883	2.80	11.88	1.60
2.900	2.40	5.900	105.42	8.900	2.80	11.90	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60
2.933	2.40	5.933	105.42	8.933	2.80	11.93	1.60
2.950	2.40	5.950	105.42	8.950	2.80	11.95	1.60
2.967	2.40	5.967	105.42	8.967	2.80	11.97	1.60
2.983	2.40	5.983	105.42	8.983	2.80	11.98	1.60
3.000	2.40	6.000	105.29	9.000	2.80	12.00	1.60

Max.Eff.Inten.(mm/hr)=	105.42	30.93	
over (min)	5.00	9.00	
Storage Coeff. (min)=	2.70 (ii)	8.47 (ii)	
Unit Hyd. Tpeak (min)=	5.00	9.00	
Unit Hyd. peak (cms)=	0.32	0.13	
			TOTALS
PEAK FLOW (cms)=	0.43	0.08	0.505 (iii)
TIME TO PEAK (hrs)=	6.00	6.07	6.00
RUNOFF VOLUME (mm)=	78.86	17.08	48.59
TOTAL RAINFALL (mm)=	79.86	79.86	79.86
RUNOFF COEFFICIENT =	0.99	0.21	0.61

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0028)	Area (ha)= 0.29
ID= 1 DT= 1.0 min	Total Imp(%)= 67.00 Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	2.00	3.017	3.19	6.017	14.37	9.02	2.80
0.033	2.00	3.033	3.19	6.033	14.37	9.03	2.80
0.050	2.00	3.050	3.19	6.050	14.37	9.05	2.80
0.067	2.00	3.067	3.19	6.067	14.37	9.07	2.80
0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.100	2.00	3.100	3.19	6.100	14.37	9.10	2.80
0.117	2.00	3.117	3.19	6.117	14.37	9.12	2.80
0.133	2.00	3.133	3.19	6.133	14.37	9.13	2.80
0.150	2.00	3.150	3.19	6.150	14.37	9.15	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.183	2.00	3.183	3.19	6.183	14.37	9.18	2.80
0.200	2.00	3.200	3.19	6.200	14.37	9.20	2.80
0.217	2.00	3.217	3.19	6.217	14.37	9.22	2.80
0.233	2.00	3.233	3.19	6.233	14.37	9.23	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.267	2.00	3.267	3.19	6.267	14.37	9.27	2.80
0.283	2.00	3.283	3.19	6.283	14.37	9.28	2.80
0.300	2.00	3.300	3.19	6.300	14.37	9.30	2.80
0.317	2.00	3.317	3.19	6.317	14.37	9.32	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.350	2.00	3.350	3.19	6.350	14.37	9.35	2.80
0.367	2.00	3.367	3.19	6.367	14.37	9.37	2.80
0.383	2.00	3.383	3.19	6.383	14.37	9.38	2.80
0.400	2.00	3.400	3.19	6.400	14.37	9.40	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.433	2.00	3.433	3.19	6.433	14.37	9.43	2.80
0.450	2.00	3.450	3.19	6.450	14.37	9.45	2.80
0.467	2.00	3.467	3.19	6.467	14.37	9.47	2.80
0.483	2.00	3.483	3.19	6.483	14.37	9.48	2.80
0.500	2.00	3.500	3.19	6.500	14.36	9.50	2.80
0.517	2.00	3.517	3.19	6.517	6.39	9.52	2.80
0.533	2.00	3.533	3.19	6.533	6.39	9.53	2.80
0.550	2.00	3.550	3.19	6.550	6.39	9.55	2.80
0.567	2.00	3.567	3.19	6.567	6.39	9.57	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.600	2.00	3.600	3.19	6.600	6.39	9.60	2.80
0.617	2.00	3.617	3.19	6.617	6.39	9.62	2.80
0.633	2.00	3.633	3.19	6.633	6.39	9.63	2.80
0.650	2.00	3.650	3.19	6.650	6.39	9.65	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.683	2.00	3.683	3.19	6.683	6.39	9.68	2.80
0.700	2.00	3.700	3.19	6.700	6.39	9.70	2.80
0.717	2.00	3.717	3.19	6.717	6.39	9.72	2.80
0.733	2.00	3.733	3.19	6.733	6.39	9.73	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.767	2.00	3.767	3.19	6.767	6.39	9.77	2.80
0.783	2.00	3.783	3.19	6.783	6.39	9.78	2.80
0.800	2.00	3.800	3.19	6.800	6.39	9.80	2.80
0.817	2.00	3.817	3.19	6.817	6.39	9.82	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.850	2.00	3.850	3.19	6.850	6.39	9.85	2.80
0.867	2.00	3.867	3.19	6.867	6.39	9.87	2.80
0.883	2.00	3.883	3.19	6.883	6.39	9.88	2.80
0.900	2.00	3.900	3.19	6.900	6.39	9.90	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
0.933	2.00	3.933	3.19	6.933	6.39	9.93	2.80
0.950	2.00	3.950	3.19	6.950	6.39	9.95	2.80
0.967	2.00	3.967	3.19	6.967	6.39	9.97	2.80
0.983	2.00	3.983	3.19	6.983	6.39	9.98	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60
1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60

1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60
1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60
1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60
1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60
2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60
2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60

```
                2.617    2.40 | 5.617   38.33 | 8.617    2.80 | 11.62    1.60
                2.633    2.40 | 5.633   38.33 | 8.633    2.80 | 11.63    1.60
                2.650    2.40 | 5.650   38.33 | 8.650    2.80 | 11.65    1.60
                2.667    2.40 | 5.667   38.33 | 8.667    2.80 | 11.67    1.60
                2.683    2.40 | 5.683   38.33 | 8.683    2.80 | 11.68    1.60
                2.700    2.40 | 5.700   38.33 | 8.700    2.80 | 11.70    1.60
                2.717    2.40 | 5.717   38.33 | 8.717    2.80 | 11.72    1.60
                2.733    2.40 | 5.733   38.33 | 8.733    2.80 | 11.73    1.60
                2.750    2.40 | 5.750   38.41 | 8.750    2.80 | 11.75    1.60
                2.767    2.40 | 5.767  105.42 | 8.767    2.80 | 11.77    1.60
                2.783    2.40 | 5.783  105.42 | 8.783    2.80 | 11.78    1.60
                2.800    2.40 | 5.800  105.42 | 8.800    2.80 | 11.80    1.60
                2.817    2.40 | 5.817  105.42 | 8.817    2.80 | 11.82    1.60
                2.833    2.40 | 5.833  105.42 | 8.833    2.80 | 11.83    1.60
                2.850    2.40 | 5.850  105.42 | 8.850    2.80 | 11.85    1.60
                2.867    2.40 | 5.867  105.42 | 8.867    2.80 | 11.87    1.60
                2.883    2.40 | 5.883  105.42 | 8.883    2.80 | 11.88    1.60
                2.900    2.40 | 5.900  105.42 | 8.900    2.80 | 11.90    1.60
                2.917    2.40 | 5.917  105.42 | 8.917    2.80 | 11.92    1.60
                2.933    2.40 | 5.933  105.42 | 8.933    2.80 | 11.93    1.60
                2.950    2.40 | 5.950  105.42 | 8.950    2.80 | 11.95    1.60
                2.967    2.40 | 5.967  105.42 | 8.967    2.80 | 11.97    1.60
                2.983    2.40 | 5.983  105.42 | 8.983    2.80 | 11.98    1.60
                3.000    2.40 | 6.000  105.29 | 9.000    2.80 | 12.00    1.60

     Max.Eff.Inten.(mm/hr)=     105.42        25.23
               over (min)        5.00         7.00
     Storage Coeff.  (min)=      1.53 (ii)    6.73 (ii)
     Unit Hyd. Tpeak (min)=      5.00         7.00
     Unit Hyd. peak  (cms)=      0.42         0.17
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.06         0.01          0.062 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.03           6.00
     RUNOFF VOLUME    (mm)=     78.86        15.51          57.94
     TOTAL RAINFALL   (mm)=     79.86        79.86          79.86
     RUNOFF COEFFICIENT   =      0.99         0.19           0.73


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.91   0.505     6.00    48.59
      + ID2= 2 (  0025):     1.43   0.081     6.25    28.02
        ================================================
        ID = 3 (  0016):     4.34   0.553     6.00    41.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.553     6.00    41.81
      + ID2= 2 (  0028):     0.29   0.062     6.00    57.94
        ================================================
        ID = 1 (  0016):     4.63   0.615     6.00    42.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.0130      0.0895
                         0.0000     0.0291    |   0.0210      0.1555
                         0.0010     0.0332    |   0.0230      0.1780
                         0.0040     0.0496    |   0.0280      0.2176
                         0.0050     0.0537    |   0.0300      0.2309
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0016)	4.630	0.615	6.00	42.82
OUTFLOW: ID= 1 (0003)	4.630	0.021	10.08	30.69

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.43
TIME SHIFT OF PEAK FLOW (min)=245.00
MAXIMUM STORAGE USED (ha.m.)= 0.1568

CALIB NASHYD (0026)	Area (ha)= 0.27	Curve Number (CN)= 71.0
ID= 1 DT= 1.0 min	Ia (mm)= 3.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.02	

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	2.00	3.017	3.19	6.017	14.37	9.02	2.80
0.033	2.00	3.033	3.19	6.033	14.37	9.03	2.80
0.050	2.00	3.050	3.19	6.050	14.37	9.05	2.80
0.067	2.00	3.067	3.19	6.067	14.37	9.07	2.80
0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.100	2.00	3.100	3.19	6.100	14.37	9.10	2.80
0.117	2.00	3.117	3.19	6.117	14.37	9.12	2.80
0.133	2.00	3.133	3.19	6.133	14.37	9.13	2.80
0.150	2.00	3.150	3.19	6.150	14.37	9.15	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.183	2.00	3.183	3.19	6.183	14.37	9.18	2.80
0.200	2.00	3.200	3.19	6.200	14.37	9.20	2.80
0.217	2.00	3.217	3.19	6.217	14.37	9.22	2.80
0.233	2.00	3.233	3.19	6.233	14.37	9.23	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.267	2.00	3.267	3.19	6.267	14.37	9.27	2.80
0.283	2.00	3.283	3.19	6.283	14.37	9.28	2.80
0.300	2.00	3.300	3.19	6.300	14.37	9.30	2.80
0.317	2.00	3.317	3.19	6.317	14.37	9.32	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.350	2.00	3.350	3.19	6.350	14.37	9.35	2.80
0.367	2.00	3.367	3.19	6.367	14.37	9.37	2.80
0.383	2.00	3.383	3.19	6.383	14.37	9.38	2.80
0.400	2.00	3.400	3.19	6.400	14.37	9.40	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.433	2.00	3.433	3.19	6.433	14.37	9.43	2.80
0.450	2.00	3.450	3.19	6.450	14.37	9.45	2.80
0.467	2.00	3.467	3.19	6.467	14.37	9.47	2.80
0.483	2.00	3.483	3.19	6.483	14.37	9.48	2.80
0.500	2.00	3.500	3.19	6.500	14.36	9.50	2.80
0.517	2.00	3.517	3.19	6.517	6.39	9.52	2.80
0.533	2.00	3.533	3.19	6.533	6.39	9.53	2.80
0.550	2.00	3.550	3.19	6.550	6.39	9.55	2.80
0.567	2.00	3.567	3.19	6.567	6.39	9.57	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.600	2.00	3.600	3.19	6.600	6.39	9.60	2.80
0.617	2.00	3.617	3.19	6.617	6.39	9.62	2.80
0.633	2.00	3.633	3.19	6.633	6.39	9.63	2.80
0.650	2.00	3.650	3.19	6.650	6.39	9.65	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.683	2.00	3.683	3.19	6.683	6.39	9.68	2.80
0.700	2.00	3.700	3.19	6.700	6.39	9.70	2.80
0.717	2.00	3.717	3.19	6.717	6.39	9.72	2.80
0.733	2.00	3.733	3.19	6.733	6.39	9.73	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.767	2.00	3.767	3.19	6.767	6.39	9.77	2.80
0.783	2.00	3.783	3.19	6.783	6.39	9.78	2.80
0.800	2.00	3.800	3.19	6.800	6.39	9.80	2.80
0.817	2.00	3.817	3.19	6.817	6.39	9.82	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.850	2.00	3.850	3.19	6.850	6.39	9.85	2.80
0.867	2.00	3.867	3.19	6.867	6.39	9.87	2.80
0.883	2.00	3.883	3.19	6.883	6.39	9.88	2.80
0.900	2.00	3.900	3.19	6.900	6.39	9.90	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
0.933	2.00	3.933	3.19	6.933	6.39	9.93	2.80

0.950	2.00	3.950	3.19	6.950	6.39	9.95	2.80
0.967	2.00	3.967	3.19	6.967	6.39	9.97	2.80
0.983	2.00	3.983	3.19	6.983	6.39	9.98	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60
1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60
1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60
1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60
1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60
1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60

2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60
2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60
2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60
2.617	2.40	5.617	38.33	8.617	2.80	11.62	1.60
2.633	2.40	5.633	38.33	8.633	2.80	11.63	1.60
2.650	2.40	5.650	38.33	8.650	2.80	11.65	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.683	2.40	5.683	38.33	8.683	2.80	11.68	1.60
2.700	2.40	5.700	38.33	8.700	2.80	11.70	1.60
2.717	2.40	5.717	38.33	8.717	2.80	11.72	1.60
2.733	2.40	5.733	38.33	8.733	2.80	11.73	1.60
2.750	2.40	5.750	38.41	8.750	2.80	11.75	1.60
2.767	2.40	5.767	105.42	8.767	2.80	11.77	1.60
2.783	2.40	5.783	105.42	8.783	2.80	11.78	1.60
2.800	2.40	5.800	105.42	8.800	2.80	11.80	1.60
2.817	2.40	5.817	105.42	8.817	2.80	11.82	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.850	2.40	5.850	105.42	8.850	2.80	11.85	1.60
2.867	2.40	5.867	105.42	8.867	2.80	11.87	1.60
2.883	2.40	5.883	105.42	8.883	2.80	11.88	1.60
2.900	2.40	5.900	105.42	8.900	2.80	11.90	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60
2.933	2.40	5.933	105.42	8.933	2.80	11.93	1.60
2.950	2.40	5.950	105.42	8.950	2.80	11.95	1.60
2.967	2.40	5.967	105.42	8.967	2.80	11.97	1.60
2.983	2.40	5.983	105.42	8.983	2.80	11.98	1.60
3.000	2.40	6.000	105.29	9.000	2.80	12.00	1.60

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.042 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 31.859
TOTAL RAINFALL (mm)= 79.859
RUNOFF COEFFICIENT = 0.399

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

CALIB	
STANDHYD (0007)	Area (ha)= 1.75
ID= 1 DT= 1.0 min	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	2.00	3.017	3.19	6.017	14.37	9.02	2.80
0.033	2.00	3.033	3.19	6.033	14.37	9.03	2.80
0.050	2.00	3.050	3.19	6.050	14.37	9.05	2.80
0.067	2.00	3.067	3.19	6.067	14.37	9.07	2.80

0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.100	2.00	3.100	3.19	6.100	14.37	9.10	2.80
0.117	2.00	3.117	3.19	6.117	14.37	9.12	2.80
0.133	2.00	3.133	3.19	6.133	14.37	9.13	2.80
0.150	2.00	3.150	3.19	6.150	14.37	9.15	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.183	2.00	3.183	3.19	6.183	14.37	9.18	2.80
0.200	2.00	3.200	3.19	6.200	14.37	9.20	2.80
0.217	2.00	3.217	3.19	6.217	14.37	9.22	2.80
0.233	2.00	3.233	3.19	6.233	14.37	9.23	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.267	2.00	3.267	3.19	6.267	14.37	9.27	2.80
0.283	2.00	3.283	3.19	6.283	14.37	9.28	2.80
0.300	2.00	3.300	3.19	6.300	14.37	9.30	2.80
0.317	2.00	3.317	3.19	6.317	14.37	9.32	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.350	2.00	3.350	3.19	6.350	14.37	9.35	2.80
0.367	2.00	3.367	3.19	6.367	14.37	9.37	2.80
0.383	2.00	3.383	3.19	6.383	14.37	9.38	2.80
0.400	2.00	3.400	3.19	6.400	14.37	9.40	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.433	2.00	3.433	3.19	6.433	14.37	9.43	2.80
0.450	2.00	3.450	3.19	6.450	14.37	9.45	2.80
0.467	2.00	3.467	3.19	6.467	14.37	9.47	2.80
0.483	2.00	3.483	3.19	6.483	14.37	9.48	2.80
0.500	2.00	3.500	3.19	6.500	14.36	9.50	2.80
0.517	2.00	3.517	3.19	6.517	6.39	9.52	2.80
0.533	2.00	3.533	3.19	6.533	6.39	9.53	2.80
0.550	2.00	3.550	3.19	6.550	6.39	9.55	2.80
0.567	2.00	3.567	3.19	6.567	6.39	9.57	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.600	2.00	3.600	3.19	6.600	6.39	9.60	2.80
0.617	2.00	3.617	3.19	6.617	6.39	9.62	2.80
0.633	2.00	3.633	3.19	6.633	6.39	9.63	2.80
0.650	2.00	3.650	3.19	6.650	6.39	9.65	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.683	2.00	3.683	3.19	6.683	6.39	9.68	2.80
0.700	2.00	3.700	3.19	6.700	6.39	9.70	2.80
0.717	2.00	3.717	3.19	6.717	6.39	9.72	2.80
0.733	2.00	3.733	3.19	6.733	6.39	9.73	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.767	2.00	3.767	3.19	6.767	6.39	9.77	2.80
0.783	2.00	3.783	3.19	6.783	6.39	9.78	2.80
0.800	2.00	3.800	3.19	6.800	6.39	9.80	2.80
0.817	2.00	3.817	3.19	6.817	6.39	9.82	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.850	2.00	3.850	3.19	6.850	6.39	9.85	2.80
0.867	2.00	3.867	3.19	6.867	6.39	9.87	2.80
0.883	2.00	3.883	3.19	6.883	6.39	9.88	2.80
0.900	2.00	3.900	3.19	6.900	6.39	9.90	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
0.933	2.00	3.933	3.19	6.933	6.39	9.93	2.80
0.950	2.00	3.950	3.19	6.950	6.39	9.95	2.80
0.967	2.00	3.967	3.19	6.967	6.39	9.97	2.80
0.983	2.00	3.983	3.19	6.983	6.39	9.98	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60
1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60
1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60

1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60
1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60
1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60
2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60
2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60
2.617	2.40	5.617	38.33	8.617	2.80	11.62	1.60
2.633	2.40	5.633	38.33	8.633	2.80	11.63	1.60
2.650	2.40	5.650	38.33	8.650	2.80	11.65	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.683	2.40	5.683	38.33	8.683	2.80	11.68	1.60
2.700	2.40	5.700	38.33	8.700	2.80	11.70	1.60

```
               2.717    2.40 | 5.717   38.33 | 8.717    2.80 | 11.72    1.60
               2.733    2.40 | 5.733   38.33 | 8.733    2.80 | 11.73    1.60
               2.750    2.40 | 5.750   38.41 | 8.750    2.80 | 11.75    1.60
               2.767    2.40 | 5.767  105.42 | 8.767    2.80 | 11.77    1.60
               2.783    2.40 | 5.783  105.42 | 8.783    2.80 | 11.78    1.60
               2.800    2.40 | 5.800  105.42 | 8.800    2.80 | 11.80    1.60
               2.817    2.40 | 5.817  105.42 | 8.817    2.80 | 11.82    1.60
               2.833    2.40 | 5.833  105.42 | 8.833    2.80 | 11.83    1.60
               2.850    2.40 | 5.850  105.42 | 8.850    2.80 | 11.85    1.60
               2.867    2.40 | 5.867  105.42 | 8.867    2.80 | 11.87    1.60
               2.883    2.40 | 5.883  105.42 | 8.883    2.80 | 11.88    1.60
               2.900    2.40 | 5.900  105.42 | 8.900    2.80 | 11.90    1.60
               2.917    2.40 | 5.917  105.42 | 8.917    2.80 | 11.92    1.60
               2.933    2.40 | 5.933  105.42 | 8.933    2.80 | 11.93    1.60
               2.950    2.40 | 5.950  105.42 | 8.950    2.80 | 11.95    1.60
               2.967    2.40 | 5.967  105.42 | 8.967    2.80 | 11.97    1.60
               2.983    2.40 | 5.983  105.42 | 8.983    2.80 | 11.98    1.60
               3.000    2.40 | 6.000  105.29 | 9.000    2.80 | 12.00    1.60

     Max.Eff.Inten.(mm/hr)=     105.42        33.74
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       2.62 (ii)    9.01 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.05          0.303 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.07           6.00
     RUNOFF VOLUME    (mm)=      78.86        17.79          48.93
     TOTAL RAINFALL   (mm)=      79.86        79.86          79.86
     RUNOFF COEFFICIENT   =       0.99         0.22           0.61


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0018)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0026):     0.27   0.042     6.00    31.86
      + ID2= 2 (  0007):     1.75   0.303     6.00    48.93
        ================================================
        ID = 3 (  0018):     2.02   0.345     6.00    46.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0009)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0007   |   0.0212      0.0291
                          0.0037     0.0045   |   0.0402      0.0316
                          0.0053     0.0065   |   0.1203      0.0341
                          0.0081     0.0128   |   0.2476      0.0366
                          0.0101     0.0188   |   0.3901      0.0373
                          0.0118     0.0250   |   0.4841      0.0381
                          0.0126     0.0279   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020      0.345      6.00      46.65
   OUTFLOW: ID= 1 (  0009)      2.020      0.320      6.02      46.17

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 92.65
                  TIME SHIFT OF PEAK FLOW         (min)=  1.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0370

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.95
```

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	2.00	3.017	3.19	6.017	14.37	9.02	2.80
0.033	2.00	3.033	3.19	6.033	14.37	9.03	2.80
0.050	2.00	3.050	3.19	6.050	14.37	9.05	2.80
0.067	2.00	3.067	3.19	6.067	14.37	9.07	2.80
0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.100	2.00	3.100	3.19	6.100	14.37	9.10	2.80
0.117	2.00	3.117	3.19	6.117	14.37	9.12	2.80
0.133	2.00	3.133	3.19	6.133	14.37	9.13	2.80
0.150	2.00	3.150	3.19	6.150	14.37	9.15	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.183	2.00	3.183	3.19	6.183	14.37	9.18	2.80
0.200	2.00	3.200	3.19	6.200	14.37	9.20	2.80
0.217	2.00	3.217	3.19	6.217	14.37	9.22	2.80
0.233	2.00	3.233	3.19	6.233	14.37	9.23	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.267	2.00	3.267	3.19	6.267	14.37	9.27	2.80
0.283	2.00	3.283	3.19	6.283	14.37	9.28	2.80
0.300	2.00	3.300	3.19	6.300	14.37	9.30	2.80
0.317	2.00	3.317	3.19	6.317	14.37	9.32	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.350	2.00	3.350	3.19	6.350	14.37	9.35	2.80
0.367	2.00	3.367	3.19	6.367	14.37	9.37	2.80
0.383	2.00	3.383	3.19	6.383	14.37	9.38	2.80
0.400	2.00	3.400	3.19	6.400	14.37	9.40	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.433	2.00	3.433	3.19	6.433	14.37	9.43	2.80
0.450	2.00	3.450	3.19	6.450	14.37	9.45	2.80
0.467	2.00	3.467	3.19	6.467	14.37	9.47	2.80
0.483	2.00	3.483	3.19	6.483	14.37	9.48	2.80
0.500	2.00	3.500	3.19	6.500	14.36	9.50	2.80
0.517	2.00	3.517	3.19	6.517	6.39	9.52	2.80
0.533	2.00	3.533	3.19	6.533	6.39	9.53	2.80
0.550	2.00	3.550	3.19	6.550	6.39	9.55	2.80
0.567	2.00	3.567	3.19	6.567	6.39	9.57	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.600	2.00	3.600	3.19	6.600	6.39	9.60	2.80
0.617	2.00	3.617	3.19	6.617	6.39	9.62	2.80
0.633	2.00	3.633	3.19	6.633	6.39	9.63	2.80
0.650	2.00	3.650	3.19	6.650	6.39	9.65	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.683	2.00	3.683	3.19	6.683	6.39	9.68	2.80
0.700	2.00	3.700	3.19	6.700	6.39	9.70	2.80
0.717	2.00	3.717	3.19	6.717	6.39	9.72	2.80
0.733	2.00	3.733	3.19	6.733	6.39	9.73	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.767	2.00	3.767	3.19	6.767	6.39	9.77	2.80
0.783	2.00	3.783	3.19	6.783	6.39	9.78	2.80
0.800	2.00	3.800	3.19	6.800	6.39	9.80	2.80
0.817	2.00	3.817	3.19	6.817	6.39	9.82	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.850	2.00	3.850	3.19	6.850	6.39	9.85	2.80
0.867	2.00	3.867	3.19	6.867	6.39	9.87	2.80
0.883	2.00	3.883	3.19	6.883	6.39	9.88	2.80
0.900	2.00	3.900	3.19	6.900	6.39	9.90	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
0.933	2.00	3.933	3.19	6.933	6.39	9.93	2.80
0.950	2.00	3.950	3.19	6.950	6.39	9.95	2.80
0.967	2.00	3.967	3.19	6.967	6.39	9.97	2.80
0.983	2.00	3.983	3.19	6.983	6.39	9.98	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60

1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60
1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60
1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60
1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60
1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60
2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60

2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60
2.617	2.40	5.617	38.33	8.617	2.80	11.62	1.60
2.633	2.40	5.633	38.33	8.633	2.80	11.63	1.60
2.650	2.40	5.650	38.33	8.650	2.80	11.65	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.683	2.40	5.683	38.33	8.683	2.80	11.68	1.60
2.700	2.40	5.700	38.33	8.700	2.80	11.70	1.60
2.717	2.40	5.717	38.33	8.717	2.80	11.72	1.60
2.733	2.40	5.733	38.33	8.733	2.80	11.73	1.60
2.750	2.40	5.750	38.41	8.750	2.80	11.75	1.60
2.767	2.40	5.767	105.42	8.767	2.80	11.77	1.60
2.783	2.40	5.783	105.42	8.783	2.80	11.78	1.60
2.800	2.40	5.800	105.42	8.800	2.80	11.80	1.60
2.817	2.40	5.817	105.42	8.817	2.80	11.82	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.850	2.40	5.850	105.42	8.850	2.80	11.85	1.60
2.867	2.40	5.867	105.42	8.867	2.80	11.87	1.60
2.883	2.40	5.883	105.42	8.883	2.80	11.88	1.60
2.900	2.40	5.900	105.42	8.900	2.80	11.90	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60
2.933	2.40	5.933	105.42	8.933	2.80	11.93	1.60
2.950	2.40	5.950	105.42	8.950	2.80	11.95	1.60
2.967	2.40	5.967	105.42	8.967	2.80	11.97	1.60
2.983	2.40	5.983	105.42	8.983	2.80	11.98	1.60
3.000	2.40	6.000	105.29	9.000	2.80	12.00	1.60

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.359 (i)
TIME TO PEAK (hrs)= 6.983
RUNOFF VOLUME (mm)= 23.300
TOTAL RAINFALL (mm)= 79.859
RUNOFF COEFFICIENT = 0.292

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

CALIB	
STANDHYD (0006)	Area (ha)= 0.75
ID= 1 DT= 1.0 min	Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	2.00	3.017	3.19	6.017	14.37	9.02	2.80
0.033	2.00	3.033	3.19	6.033	14.37	9.03	2.80
0.050	2.00	3.050	3.19	6.050	14.37	9.05	2.80
0.067	2.00	3.067	3.19	6.067	14.37	9.07	2.80
0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.100	2.00	3.100	3.19	6.100	14.37	9.10	2.80
0.117	2.00	3.117	3.19	6.117	14.37	9.12	2.80
0.133	2.00	3.133	3.19	6.133	14.37	9.13	2.80
0.150	2.00	3.150	3.19	6.150	14.37	9.15	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.183	2.00	3.183	3.19	6.183	14.37	9.18	2.80
0.200	2.00	3.200	3.19	6.200	14.37	9.20	2.80
0.217	2.00	3.217	3.19	6.217	14.37	9.22	2.80
0.233	2.00	3.233	3.19	6.233	14.37	9.23	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.267	2.00	3.267	3.19	6.267	14.37	9.27	2.80
0.283	2.00	3.283	3.19	6.283	14.37	9.28	2.80
0.300	2.00	3.300	3.19	6.300	14.37	9.30	2.80
0.317	2.00	3.317	3.19	6.317	14.37	9.32	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80

0.350	2.00	3.350	3.19	6.350	14.37	9.35	2.80
0.367	2.00	3.367	3.19	6.367	14.37	9.37	2.80
0.383	2.00	3.383	3.19	6.383	14.37	9.38	2.80
0.400	2.00	3.400	3.19	6.400	14.37	9.40	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.433	2.00	3.433	3.19	6.433	14.37	9.43	2.80
0.450	2.00	3.450	3.19	6.450	14.37	9.45	2.80
0.467	2.00	3.467	3.19	6.467	14.37	9.47	2.80
0.483	2.00	3.483	3.19	6.483	14.37	9.48	2.80
0.500	2.00	3.500	3.19	6.500	14.36	9.50	2.80
0.517	2.00	3.517	3.19	6.517	6.39	9.52	2.80
0.533	2.00	3.533	3.19	6.533	6.39	9.53	2.80
0.550	2.00	3.550	3.19	6.550	6.39	9.55	2.80
0.567	2.00	3.567	3.19	6.567	6.39	9.57	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.600	2.00	3.600	3.19	6.600	6.39	9.60	2.80
0.617	2.00	3.617	3.19	6.617	6.39	9.62	2.80
0.633	2.00	3.633	3.19	6.633	6.39	9.63	2.80
0.650	2.00	3.650	3.19	6.650	6.39	9.65	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.683	2.00	3.683	3.19	6.683	6.39	9.68	2.80
0.700	2.00	3.700	3.19	6.700	6.39	9.70	2.80
0.717	2.00	3.717	3.19	6.717	6.39	9.72	2.80
0.733	2.00	3.733	3.19	6.733	6.39	9.73	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.767	2.00	3.767	3.19	6.767	6.39	9.77	2.80
0.783	2.00	3.783	3.19	6.783	6.39	9.78	2.80
0.800	2.00	3.800	3.19	6.800	6.39	9.80	2.80
0.817	2.00	3.817	3.19	6.817	6.39	9.82	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.850	2.00	3.850	3.19	6.850	6.39	9.85	2.80
0.867	2.00	3.867	3.19	6.867	6.39	9.87	2.80
0.883	2.00	3.883	3.19	6.883	6.39	9.88	2.80
0.900	2.00	3.900	3.19	6.900	6.39	9.90	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
0.933	2.00	3.933	3.19	6.933	6.39	9.93	2.80
0.950	2.00	3.950	3.19	6.950	6.39	9.95	2.80
0.967	2.00	3.967	3.19	6.967	6.39	9.97	2.80
0.983	2.00	3.983	3.19	6.983	6.39	9.98	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60
1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60
1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60
1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60
1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60

1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60
1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60
2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60
2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60
2.617	2.40	5.617	38.33	8.617	2.80	11.62	1.60
2.633	2.40	5.633	38.33	8.633	2.80	11.63	1.60
2.650	2.40	5.650	38.33	8.650	2.80	11.65	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.683	2.40	5.683	38.33	8.683	2.80	11.68	1.60
2.700	2.40	5.700	38.33	8.700	2.80	11.70	1.60
2.717	2.40	5.717	38.33	8.717	2.80	11.72	1.60
2.733	2.40	5.733	38.33	8.733	2.80	11.73	1.60
2.750	2.40	5.750	38.41	8.750	2.80	11.75	1.60
2.767	2.40	5.767	105.42	8.767	2.80	11.77	1.60
2.783	2.40	5.783	105.42	8.783	2.80	11.78	1.60
2.800	2.40	5.800	105.42	8.800	2.80	11.80	1.60
2.817	2.40	5.817	105.42	8.817	2.80	11.82	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.850	2.40	5.850	105.42	8.850	2.80	11.85	1.60
2.867	2.40	5.867	105.42	8.867	2.80	11.87	1.60
2.883	2.40	5.883	105.42	8.883	2.80	11.88	1.60
2.900	2.40	5.900	105.42	8.900	2.80	11.90	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60
2.933	2.40	5.933	105.42	8.933	2.80	11.93	1.60
2.950	2.40	5.950	105.42	8.950	2.80	11.95	1.60
2.967	2.40	5.967	105.42	8.967	2.80	11.97	1.60

```
             2.983    2.40 | 5.983  105.42 | 8.983    2.80 | 11.98    1.60
             3.000    2.40 | 6.000  105.29 | 9.000    2.80 | 12.00    1.60

     Max.Eff.Inten.(mm/hr)=     105.42       135.81
               over (min)        5.00         6.00
     Storage Coeff.  (min)=       2.03 (ii)    5.13 (ii)
     Unit Hyd. Tpeak (min)=       5.00         6.00
     Unit Hyd. peak  (cms)=       0.37         0.21
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.03          0.187 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.02          6.00
     RUNOFF VOLUME    (mm)=      78.86        32.29         66.75
     TOTAL RAINFALL   (mm)=      79.86        79.86         79.86
     RUNOFF COEFFICIENT   =       0.99         0.40          0.84


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0011)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0912      0.0179
                          0.0006     0.0005    |   0.1027      0.0204
                          0.0062     0.0056    |   0.1264      0.0248
                          0.0100     0.0060    |   0.1349      0.0263
                          0.0470     0.0101    |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0006)      0.750      0.187      6.00      66.75
   OUTFLOW: ID= 1 (  0011)      0.750      0.094      6.08      66.47

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 50.35
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0186

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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    2.00 | 3.017    3.19 | 6.017   14.37 |  9.02    2.80
               0.033    2.00 | 3.033    3.19 | 6.033   14.37 |  9.03    2.80
               0.050    2.00 | 3.050    3.19 | 6.050   14.37 |  9.05    2.80
               0.067    2.00 | 3.067    3.19 | 6.067   14.37 |  9.07    2.80
               0.083    2.00 | 3.083    3.19 | 6.083   14.37 |  9.08    2.80
               0.100    2.00 | 3.100    3.19 | 6.100   14.37 |  9.10    2.80
               0.117    2.00 | 3.117    3.19 | 6.117   14.37 |  9.12    2.80
               0.133    2.00 | 3.133    3.19 | 6.133   14.37 |  9.13    2.80
               0.150    2.00 | 3.150    3.19 | 6.150   14.37 |  9.15    2.80
               0.167    2.00 | 3.167    3.19 | 6.167   14.37 |  9.17    2.80
               0.183    2.00 | 3.183    3.19 | 6.183   14.37 |  9.18    2.80
               0.200    2.00 | 3.200    3.19 | 6.200   14.37 |  9.20    2.80
               0.217    2.00 | 3.217    3.19 | 6.217   14.37 |  9.22    2.80
               0.233    2.00 | 3.233    3.19 | 6.233   14.37 |  9.23    2.80
               0.250    2.00 | 3.250    3.19 | 6.250   14.37 |  9.25    2.80
               0.267    2.00 | 3.267    3.19 | 6.267   14.37 |  9.27    2.80
               0.283    2.00 | 3.283    3.19 | 6.283   14.37 |  9.28    2.80
```

0.300	2.00	3.300	3.19	6.300	14.37	9.30	2.80
0.317	2.00	3.317	3.19	6.317	14.37	9.32	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.350	2.00	3.350	3.19	6.350	14.37	9.35	2.80
0.367	2.00	3.367	3.19	6.367	14.37	9.37	2.80
0.383	2.00	3.383	3.19	6.383	14.37	9.38	2.80
0.400	2.00	3.400	3.19	6.400	14.37	9.40	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.433	2.00	3.433	3.19	6.433	14.37	9.43	2.80
0.450	2.00	3.450	3.19	6.450	14.37	9.45	2.80
0.467	2.00	3.467	3.19	6.467	14.37	9.47	2.80
0.483	2.00	3.483	3.19	6.483	14.37	9.48	2.80
0.500	2.00	3.500	3.19	6.500	14.36	9.50	2.80
0.517	2.00	3.517	3.19	6.517	6.39	9.52	2.80
0.533	2.00	3.533	3.19	6.533	6.39	9.53	2.80
0.550	2.00	3.550	3.19	6.550	6.39	9.55	2.80
0.567	2.00	3.567	3.19	6.567	6.39	9.57	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.600	2.00	3.600	3.19	6.600	6.39	9.60	2.80
0.617	2.00	3.617	3.19	6.617	6.39	9.62	2.80
0.633	2.00	3.633	3.19	6.633	6.39	9.63	2.80
0.650	2.00	3.650	3.19	6.650	6.39	9.65	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.683	2.00	3.683	3.19	6.683	6.39	9.68	2.80
0.700	2.00	3.700	3.19	6.700	6.39	9.70	2.80
0.717	2.00	3.717	3.19	6.717	6.39	9.72	2.80
0.733	2.00	3.733	3.19	6.733	6.39	9.73	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.767	2.00	3.767	3.19	6.767	6.39	9.77	2.80
0.783	2.00	3.783	3.19	6.783	6.39	9.78	2.80
0.800	2.00	3.800	3.19	6.800	6.39	9.80	2.80
0.817	2.00	3.817	3.19	6.817	6.39	9.82	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.850	2.00	3.850	3.19	6.850	6.39	9.85	2.80
0.867	2.00	3.867	3.19	6.867	6.39	9.87	2.80
0.883	2.00	3.883	3.19	6.883	6.39	9.88	2.80
0.900	2.00	3.900	3.19	6.900	6.39	9.90	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
0.933	2.00	3.933	3.19	6.933	6.39	9.93	2.80
0.950	2.00	3.950	3.19	6.950	6.39	9.95	2.80
0.967	2.00	3.967	3.19	6.967	6.39	9.97	2.80
0.983	2.00	3.983	3.19	6.983	6.39	9.98	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.79
1.017	2.00	4.017	4.79	7.017	4.79	10.02	1.60
1.033	2.00	4.033	4.79	7.033	4.79	10.03	1.60
1.050	2.00	4.050	4.79	7.050	4.79	10.05	1.60
1.067	2.00	4.067	4.79	7.067	4.79	10.07	1.60
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.100	2.00	4.100	4.79	7.100	4.79	10.10	1.60
1.117	2.00	4.117	4.79	7.117	4.79	10.12	1.60
1.133	2.00	4.133	4.79	7.133	4.79	10.13	1.60
1.150	2.00	4.150	4.79	7.150	4.79	10.15	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60
1.183	2.00	4.183	4.79	7.183	4.79	10.18	1.60
1.200	2.00	4.200	4.79	7.200	4.79	10.20	1.60
1.217	2.00	4.217	4.79	7.217	4.79	10.22	1.60
1.233	2.00	4.233	4.79	7.233	4.79	10.23	1.60
1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.267	2.00	4.267	4.79	7.267	4.79	10.27	1.60
1.283	2.00	4.283	4.79	7.283	4.79	10.28	1.60
1.300	2.00	4.300	4.79	7.300	4.79	10.30	1.60
1.317	2.00	4.317	4.79	7.317	4.79	10.32	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.350	2.00	4.350	4.79	7.350	4.79	10.35	1.60
1.367	2.00	4.367	4.79	7.367	4.79	10.37	1.60
1.383	2.00	4.383	4.79	7.383	4.79	10.38	1.60
1.400	2.00	4.400	4.79	7.400	4.79	10.40	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.433	2.00	4.433	4.79	7.433	4.79	10.43	1.60
1.450	2.00	4.450	4.79	7.450	4.79	10.45	1.60
1.467	2.00	4.467	4.79	7.467	4.79	10.47	1.60
1.483	2.00	4.483	4.79	7.483	4.79	10.48	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.517	2.00	4.517	6.39	7.517	4.79	10.52	1.60
1.533	2.00	4.533	6.39	7.533	4.79	10.53	1.60
1.550	2.00	4.550	6.39	7.550	4.79	10.55	1.60
1.567	2.00	4.567	6.39	7.567	4.79	10.57	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.600	2.00	4.600	6.39	7.600	4.79	10.60	1.60

1.617	2.00	4.617	6.39	7.617	4.79	10.62	1.60
1.633	2.00	4.633	6.39	7.633	4.79	10.63	1.60
1.650	2.00	4.650	6.39	7.650	4.79	10.65	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.683	2.00	4.683	6.39	7.683	4.79	10.68	1.60
1.700	2.00	4.700	6.39	7.700	4.79	10.70	1.60
1.717	2.00	4.717	6.39	7.717	4.79	10.72	1.60
1.733	2.00	4.733	6.39	7.733	4.79	10.73	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.767	2.00	4.767	6.39	7.767	4.79	10.77	1.60
1.783	2.00	4.783	6.39	7.783	4.79	10.78	1.60
1.800	2.00	4.800	6.39	7.800	4.79	10.80	1.60
1.817	2.00	4.817	6.39	7.817	4.79	10.82	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.850	2.00	4.850	6.39	7.850	4.79	10.85	1.60
1.867	2.00	4.867	6.39	7.867	4.79	10.87	1.60
1.883	2.00	4.883	6.39	7.883	4.79	10.88	1.60
1.900	2.00	4.900	6.39	7.900	4.79	10.90	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
1.933	2.00	4.933	6.39	7.933	4.79	10.93	1.60
1.950	2.00	4.950	6.39	7.950	4.79	10.95	1.60
1.967	2.00	4.967	6.39	7.967	4.79	10.97	1.60
1.983	2.00	4.983	6.39	7.983	4.79	10.98	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.017	2.40	5.017	9.58	8.017	2.80	11.02	1.60
2.033	2.40	5.033	9.58	8.033	2.80	11.03	1.60
2.050	2.40	5.050	9.58	8.050	2.80	11.05	1.60
2.067	2.40	5.067	9.58	8.067	2.80	11.07	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.100	2.40	5.100	9.58	8.100	2.80	11.10	1.60
2.117	2.40	5.117	9.58	8.117	2.80	11.12	1.60
2.133	2.40	5.133	9.58	8.133	2.80	11.13	1.60
2.150	2.40	5.150	9.58	8.150	2.80	11.15	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.183	2.40	5.183	9.58	8.183	2.80	11.18	1.60
2.200	2.40	5.200	9.58	8.200	2.80	11.20	1.60
2.217	2.40	5.217	9.58	8.217	2.80	11.22	1.60
2.233	2.40	5.233	9.58	8.233	2.80	11.23	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.267	2.40	5.267	9.58	8.267	2.80	11.27	1.60
2.283	2.40	5.283	9.58	8.283	2.80	11.28	1.60
2.300	2.40	5.300	9.58	8.300	2.80	11.30	1.60
2.317	2.40	5.317	9.58	8.317	2.80	11.32	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.350	2.40	5.350	9.58	8.350	2.80	11.35	1.60
2.367	2.40	5.367	9.58	8.367	2.80	11.37	1.60
2.383	2.40	5.383	9.58	8.383	2.80	11.38	1.60
2.400	2.40	5.400	9.58	8.400	2.80	11.40	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.433	2.40	5.433	9.58	8.433	2.80	11.43	1.60
2.450	2.40	5.450	9.58	8.450	2.80	11.45	1.60
2.467	2.40	5.467	9.58	8.467	2.80	11.47	1.60
2.483	2.40	5.483	9.58	8.483	2.80	11.48	1.60
2.500	2.40	5.500	9.61	8.500	2.80	11.50	1.60
2.517	2.40	5.517	38.33	8.517	2.80	11.52	1.60
2.533	2.40	5.533	38.33	8.533	2.80	11.53	1.60
2.550	2.40	5.550	38.33	8.550	2.80	11.55	1.60
2.567	2.40	5.567	38.33	8.567	2.80	11.57	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.600	2.40	5.600	38.33	8.600	2.80	11.60	1.60
2.617	2.40	5.617	38.33	8.617	2.80	11.62	1.60
2.633	2.40	5.633	38.33	8.633	2.80	11.63	1.60
2.650	2.40	5.650	38.33	8.650	2.80	11.65	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.683	2.40	5.683	38.33	8.683	2.80	11.68	1.60
2.700	2.40	5.700	38.33	8.700	2.80	11.70	1.60
2.717	2.40	5.717	38.33	8.717	2.80	11.72	1.60
2.733	2.40	5.733	38.33	8.733	2.80	11.73	1.60
2.750	2.40	5.750	38.41	8.750	2.80	11.75	1.60
2.767	2.40	5.767	105.42	8.767	2.80	11.77	1.60
2.783	2.40	5.783	105.42	8.783	2.80	11.78	1.60
2.800	2.40	5.800	105.42	8.800	2.80	11.80	1.60
2.817	2.40	5.817	105.42	8.817	2.80	11.82	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.850	2.40	5.850	105.42	8.850	2.80	11.85	1.60
2.867	2.40	5.867	105.42	8.867	2.80	11.87	1.60
2.883	2.40	5.883	105.42	8.883	2.80	11.88	1.60
2.900	2.40	5.900	105.42	8.900	2.80	11.90	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60

2.933	2.40	5.933	105.42	8.933	2.80	11.93	1.60
2.950	2.40	5.950	105.42	8.950	2.80	11.95	1.60
2.967	2.40	5.967	105.42	8.967	2.80	11.97	1.60
2.983	2.40	5.983	105.42	8.983	2.80	11.98	1.60
3.000	2.40	6.000	105.29	9.000	2.80	12.00	1.60

Max.Eff.Inten.(mm/hr)=	105.42	43.61	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.81 (ii)	9.46 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.12	
			TOTALS
PEAK FLOW (cms)=	0.29	0.08	0.355 (iii)
TIME TO PEAK (hrs)=	6.00	6.07	6.00
RUNOFF VOLUME (mm)=	78.86	20.01	46.49
TOTAL RAINFALL (mm)=	79.86	79.86	79.86
RUNOFF COEFFICIENT =	0.99	0.25	0.58

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)	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	0.0570	0.0442
	0.0008	0.0012	0.0640	0.0503
	0.0063	0.0138	0.0780	0.0611
	0.0090	0.0149	0.0830	0.0649
	0.0320	0.0249	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)	2.200	0.355	6.00	46.49
OUTFLOW: ID= 1 (0010)	2.200	0.068	6.40	46.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.08
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.0532

CALIB		
STANDHYD (0039)	Area (ha)= 0.08	
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.04	0.04
Dep. Storage (mm)=	1.00	2.30
Average Slope (%)=	1.00	2.00
Length (m)=	23.09	40.00
Mannings n =	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.00	3.083	3.19	6.083	14.37	9.08	2.80
0.167	2.00	3.167	3.19	6.167	14.37	9.17	2.80
0.250	2.00	3.250	3.19	6.250	14.37	9.25	2.80
0.333	2.00	3.333	3.19	6.333	14.37	9.33	2.80
0.417	2.00	3.417	3.19	6.417	14.37	9.42	2.80
0.500	2.00	3.500	3.19	6.500	14.37	9.50	2.80
0.583	2.00	3.583	3.19	6.583	6.39	9.58	2.80
0.667	2.00	3.667	3.19	6.667	6.39	9.67	2.80
0.750	2.00	3.750	3.19	6.750	6.39	9.75	2.80
0.833	2.00	3.833	3.19	6.833	6.39	9.83	2.80
0.917	2.00	3.917	3.19	6.917	6.39	9.92	2.80
1.000	2.00	4.000	3.19	7.000	6.39	10.00	2.80
1.083	2.00	4.083	4.79	7.083	4.79	10.08	1.60
1.167	2.00	4.167	4.79	7.167	4.79	10.17	1.60

1.250	2.00	4.250	4.79	7.250	4.79	10.25	1.60
1.333	2.00	4.333	4.79	7.333	4.79	10.33	1.60
1.417	2.00	4.417	4.79	7.417	4.79	10.42	1.60
1.500	2.00	4.500	4.79	7.500	4.79	10.50	1.60
1.583	2.00	4.583	6.39	7.583	4.79	10.58	1.60
1.667	2.00	4.667	6.39	7.667	4.79	10.67	1.60
1.750	2.00	4.750	6.39	7.750	4.79	10.75	1.60
1.833	2.00	4.833	6.39	7.833	4.79	10.83	1.60
1.917	2.00	4.917	6.39	7.917	4.79	10.92	1.60
2.000	2.00	5.000	6.39	8.000	4.79	11.00	1.60
2.083	2.40	5.083	9.58	8.083	2.80	11.08	1.60
2.167	2.40	5.167	9.58	8.167	2.80	11.17	1.60
2.250	2.40	5.250	9.58	8.250	2.80	11.25	1.60
2.333	2.40	5.333	9.58	8.333	2.80	11.33	1.60
2.417	2.40	5.417	9.58	8.417	2.80	11.42	1.60
2.500	2.40	5.500	9.58	8.500	2.80	11.50	1.60
2.583	2.40	5.583	38.33	8.583	2.80	11.58	1.60
2.667	2.40	5.667	38.33	8.667	2.80	11.67	1.60
2.750	2.40	5.750	38.33	8.750	2.80	11.75	1.60
2.833	2.40	5.833	105.42	8.833	2.80	11.83	1.60
2.917	2.40	5.917	105.42	8.917	2.80	11.92	1.60
3.000	2.40	6.000	105.41	9.000	2.80	12.00	1.60

Max.Eff.Inten.(mm/hr)=	105.42	130.51	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.04 (ii)	7.38 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.13	
			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.020 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	78.86	67.34	71.30
TOTAL RAINFALL (mm)=	79.86	79.86	79.86
RUNOFF COEFFICIENT =	0.99	0.84	0.89

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 94.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	2.20	0.068	6.40	46.32
+ ID2= 2 (0011):	0.75	0.094	6.08	66.47
ID = 3 (0004):	2.95	0.157	6.10	51.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0004):	2.95	0.157	6.10	51.44
+ ID2= 2 (0027):	16.11	0.359	6.98	23.30
ID = 1 (0004):	19.06	0.450	6.83	27.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	19.06	0.450	6.83	27.66
+ ID2= 2 (0003):	4.63	0.021	10.08	30.69
ID = 3 (0004):	23.69	0.469	6.85	28.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0004):    23.69   0.469     6.85    28.25
     + ID2= 2 (  0039):     0.08   0.020     6.00    71.30
       ================================================
       ID = 1 (  0004):    23.77   0.470     6.85    28.39

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):    23.77   0.470     6.85    28.39
     + ID2= 2 (  0009):     2.02   0.320     6.02    46.17
       ================================================
       ID = 3 (  0004):    25.79   0.578     6.03    29.79

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  ***********************************************
  ** SIMULATION : Run 11                       **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\pcallaghan\AppD
|                  |              ata\Local\Temp\
|                  |              d1c59b48-457d-442d-8825-8b87b5d6c641\3a4df615
| Ptotal= 87.91 mm |    Comments: 50-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    2.20 |  3.25    3.52 |  6.25   15.82 |  9.25    3.08
                0.50    2.20 |  3.50    3.52 |  6.50   15.82 |  9.50    3.08
                0.75    2.20 |  3.75    3.52 |  6.75    7.03 |  9.75    3.08
                1.00    2.20 |  4.00    3.52 |  7.00    7.03 | 10.00    3.08
                1.25    2.20 |  4.25    5.27 |  7.25    5.27 | 10.25    1.76
                1.50    2.20 |  4.50    5.27 |  7.50    5.27 | 10.50    1.76
                1.75    2.20 |  4.75    7.03 |  7.75    5.27 | 10.75    1.76
                2.00    2.20 |  5.00    7.03 |  8.00    5.27 | 11.00    1.76
                2.25    2.64 |  5.25   10.55 |  8.25    3.08 | 11.25    1.76
                2.50    2.64 |  5.50   10.55 |  8.50    3.08 | 11.50    1.76
                2.75    2.64 |  5.75   42.20 |  8.75    3.08 | 11.75    1.76
                3.00    2.64 |  6.00  116.04 |  9.00    3.08 | 12.00    1.76

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

--------------------
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

        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    2.20 | 3.017    3.52 | 6.017   15.82 |  9.02    3.08
               0.033    2.20 | 3.033    3.52 | 6.033   15.82 |  9.03    3.08
               0.050    2.20 | 3.050    3.52 | 6.050   15.82 |  9.05    3.08
               0.067    2.20 | 3.067    3.52 | 6.067   15.82 |  9.07    3.08
               0.083    2.20 | 3.083    3.52 | 6.083   15.82 |  9.08    3.08
               0.100    2.20 | 3.100    3.52 | 6.100   15.82 |  9.10    3.08
               0.117    2.20 | 3.117    3.52 | 6.117   15.82 |  9.12    3.08
               0.133    2.20 | 3.133    3.52 | 6.133   15.82 |  9.13    3.08
               0.150    2.20 | 3.150    3.52 | 6.150   15.82 |  9.15    3.08
               0.167    2.20 | 3.167    3.52 | 6.167   15.82 |  9.17    3.08
               0.183    2.20 | 3.183    3.52 | 6.183   15.82 |  9.18    3.08
               0.200    2.20 | 3.200    3.52 | 6.200   15.82 |  9.20    3.08
               0.217    2.20 | 3.217    3.52 | 6.217   15.82 |  9.22    3.08
               0.233    2.20 | 3.233    3.52 | 6.233   15.82 |  9.23    3.08
```

0.250	2.20	3.250	3.52	6.250	15.82	9.25	3.08
0.267	2.20	3.267	3.52	6.267	15.82	9.27	3.08
0.283	2.20	3.283	3.52	6.283	15.82	9.28	3.08
0.300	2.20	3.300	3.52	6.300	15.82	9.30	3.08
0.317	2.20	3.317	3.52	6.317	15.82	9.32	3.08
0.333	2.20	3.333	3.52	6.333	15.82	9.33	3.08
0.350	2.20	3.350	3.52	6.350	15.82	9.35	3.08
0.367	2.20	3.367	3.52	6.367	15.82	9.37	3.08
0.383	2.20	3.383	3.52	6.383	15.82	9.38	3.08
0.400	2.20	3.400	3.52	6.400	15.82	9.40	3.08
0.417	2.20	3.417	3.52	6.417	15.82	9.42	3.08
0.433	2.20	3.433	3.52	6.433	15.82	9.43	3.08
0.450	2.20	3.450	3.52	6.450	15.82	9.45	3.08
0.467	2.20	3.467	3.52	6.467	15.82	9.47	3.08
0.483	2.20	3.483	3.52	6.483	15.82	9.48	3.08
0.500	2.20	3.500	3.52	6.500	15.81	9.50	3.08
0.517	2.20	3.517	3.52	6.517	7.03	9.52	3.08
0.533	2.20	3.533	3.52	6.533	7.03	9.53	3.08
0.550	2.20	3.550	3.52	6.550	7.03	9.55	3.08
0.567	2.20	3.567	3.52	6.567	7.03	9.57	3.08
0.583	2.20	3.583	3.52	6.583	7.03	9.58	3.08
0.600	2.20	3.600	3.52	6.600	7.03	9.60	3.08
0.617	2.20	3.617	3.52	6.617	7.03	9.62	3.08
0.633	2.20	3.633	3.52	6.633	7.03	9.63	3.08
0.650	2.20	3.650	3.52	6.650	7.03	9.65	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.683	2.20	3.683	3.52	6.683	7.03	9.68	3.08
0.700	2.20	3.700	3.52	6.700	7.03	9.70	3.08
0.717	2.20	3.717	3.52	6.717	7.03	9.72	3.08
0.733	2.20	3.733	3.52	6.733	7.03	9.73	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.767	2.20	3.767	3.52	6.767	7.03	9.77	3.08
0.783	2.20	3.783	3.52	6.783	7.03	9.78	3.08
0.800	2.20	3.800	3.52	6.800	7.03	9.80	3.08
0.817	2.20	3.817	3.52	6.817	7.03	9.82	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.850	2.20	3.850	3.52	6.850	7.03	9.85	3.08
0.867	2.20	3.867	3.52	6.867	7.03	9.87	3.08
0.883	2.20	3.883	3.52	6.883	7.03	9.88	3.08
0.900	2.20	3.900	3.52	6.900	7.03	9.90	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
0.933	2.20	3.933	3.52	6.933	7.03	9.93	3.08
0.950	2.20	3.950	3.52	6.950	7.03	9.95	3.08
0.967	2.20	3.967	3.52	6.967	7.03	9.97	3.08
0.983	2.20	3.983	3.52	6.983	7.03	9.98	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76
1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76
1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76

1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76
1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76
2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76
2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76
2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76
2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.683	2.64	5.683	42.20	8.683	3.08	11.68	1.76
2.700	2.64	5.700	42.20	8.700	3.08	11.70	1.76
2.717	2.64	5.717	42.20	8.717	3.08	11.72	1.76
2.733	2.64	5.733	42.20	8.733	3.08	11.73	1.76
2.750	2.64	5.750	42.29	8.750	3.08	11.75	1.76
2.767	2.64	5.767	116.04	8.767	3.08	11.77	1.76
2.783	2.64	5.783	116.04	8.783	3.08	11.78	1.76
2.800	2.64	5.800	116.04	8.800	3.08	11.80	1.76
2.817	2.64	5.817	116.04	8.817	3.08	11.82	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.850	2.64	5.850	116.04	8.850	3.08	11.85	1.76
2.867	2.64	5.867	116.04	8.867	3.08	11.87	1.76

2.883	2.64	5.883	116.04	8.883	3.08	11.88	1.76
2.900	2.64	5.900	116.04	8.900	3.08	11.90	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
2.933	2.64	5.933	116.04	8.933	3.08	11.93	1.76
2.950	2.64	5.950	116.04	8.950	3.08	11.95	1.76
2.967	2.64	5.967	116.04	8.967	3.08	11.97	1.76
2.983	2.64	5.983	116.04	8.983	3.08	11.98	1.76
3.000	2.64	6.000	115.90	9.000	3.08	12.00	1.76

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.096 (i)
TIME TO PEAK (hrs)= 6.233
RUNOFF VOLUME (mm)= 33.045
TOTAL RAINFALL (mm)= 87.909
RUNOFF COEFFICIENT = 0.376

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

CALIB	
STANDHYD (0001)	Area (ha)= 2.91
ID= 1 DT= 1.0 min	Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	2.20	3.017	3.52	6.017	15.82	9.02	3.08
0.033	2.20	3.033	3.52	6.033	15.82	9.03	3.08
0.050	2.20	3.050	3.52	6.050	15.82	9.05	3.08
0.067	2.20	3.067	3.52	6.067	15.82	9.07	3.08
0.083	2.20	3.083	3.52	6.083	15.82	9.08	3.08
0.100	2.20	3.100	3.52	6.100	15.82	9.10	3.08
0.117	2.20	3.117	3.52	6.117	15.82	9.12	3.08
0.133	2.20	3.133	3.52	6.133	15.82	9.13	3.08
0.150	2.20	3.150	3.52	6.150	15.82	9.15	3.08
0.167	2.20	3.167	3.52	6.167	15.82	9.17	3.08
0.183	2.20	3.183	3.52	6.183	15.82	9.18	3.08
0.200	2.20	3.200	3.52	6.200	15.82	9.20	3.08
0.217	2.20	3.217	3.52	6.217	15.82	9.22	3.08
0.233	2.20	3.233	3.52	6.233	15.82	9.23	3.08
0.250	2.20	3.250	3.52	6.250	15.82	9.25	3.08
0.267	2.20	3.267	3.52	6.267	15.82	9.27	3.08
0.283	2.20	3.283	3.52	6.283	15.82	9.28	3.08
0.300	2.20	3.300	3.52	6.300	15.82	9.30	3.08
0.317	2.20	3.317	3.52	6.317	15.82	9.32	3.08
0.333	2.20	3.333	3.52	6.333	15.82	9.33	3.08
0.350	2.20	3.350	3.52	6.350	15.82	9.35	3.08
0.367	2.20	3.367	3.52	6.367	15.82	9.37	3.08
0.383	2.20	3.383	3.52	6.383	15.82	9.38	3.08
0.400	2.20	3.400	3.52	6.400	15.82	9.40	3.08
0.417	2.20	3.417	3.52	6.417	15.82	9.42	3.08
0.433	2.20	3.433	3.52	6.433	15.82	9.43	3.08
0.450	2.20	3.450	3.52	6.450	15.82	9.45	3.08
0.467	2.20	3.467	3.52	6.467	15.82	9.47	3.08
0.483	2.20	3.483	3.52	6.483	15.82	9.48	3.08
0.500	2.20	3.500	3.52	6.500	15.81	9.50	3.08
0.517	2.20	3.517	3.52	6.517	7.03	9.52	3.08
0.533	2.20	3.533	3.52	6.533	7.03	9.53	3.08
0.550	2.20	3.550	3.52	6.550	7.03	9.55	3.08
0.567	2.20	3.567	3.52	6.567	7.03	9.57	3.08
0.583	2.20	3.583	3.52	6.583	7.03	9.58	3.08
0.600	2.20	3.600	3.52	6.600	7.03	9.60	3.08
0.617	2.20	3.617	3.52	6.617	7.03	9.62	3.08
0.633	2.20	3.633	3.52	6.633	7.03	9.63	3.08
0.650	2.20	3.650	3.52	6.650	7.03	9.65	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.683	2.20	3.683	3.52	6.683	7.03	9.68	3.08

0.700	2.20	3.700	3.52	6.700	7.03	9.70	3.08
0.717	2.20	3.717	3.52	6.717	7.03	9.72	3.08
0.733	2.20	3.733	3.52	6.733	7.03	9.73	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.767	2.20	3.767	3.52	6.767	7.03	9.77	3.08
0.783	2.20	3.783	3.52	6.783	7.03	9.78	3.08
0.800	2.20	3.800	3.52	6.800	7.03	9.80	3.08
0.817	2.20	3.817	3.52	6.817	7.03	9.82	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.850	2.20	3.850	3.52	6.850	7.03	9.85	3.08
0.867	2.20	3.867	3.52	6.867	7.03	9.87	3.08
0.883	2.20	3.883	3.52	6.883	7.03	9.88	3.08
0.900	2.20	3.900	3.52	6.900	7.03	9.90	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
0.933	2.20	3.933	3.52	6.933	7.03	9.93	3.08
0.950	2.20	3.950	3.52	6.950	7.03	9.95	3.08
0.967	2.20	3.967	3.52	6.967	7.03	9.97	3.08
0.983	2.20	3.983	3.52	6.983	7.03	9.98	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76
1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76
1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76
1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76
1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76

2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76
2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76
2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76
2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.683	2.64	5.683	42.20	8.683	3.08	11.68	1.76
2.700	2.64	5.700	42.20	8.700	3.08	11.70	1.76
2.717	2.64	5.717	42.20	8.717	3.08	11.72	1.76
2.733	2.64	5.733	42.20	8.733	3.08	11.73	1.76
2.750	2.64	5.750	42.29	8.750	3.08	11.75	1.76
2.767	2.64	5.767	116.04	8.767	3.08	11.77	1.76
2.783	2.64	5.783	116.04	8.783	3.08	11.78	1.76
2.800	2.64	5.800	116.04	8.800	3.08	11.80	1.76
2.817	2.64	5.817	116.04	8.817	3.08	11.82	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.850	2.64	5.850	116.04	8.850	3.08	11.85	1.76
2.867	2.64	5.867	116.04	8.867	3.08	11.87	1.76
2.883	2.64	5.883	116.04	8.883	3.08	11.88	1.76
2.900	2.64	5.900	116.04	8.900	3.08	11.90	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
2.933	2.64	5.933	116.04	8.933	3.08	11.93	1.76
2.950	2.64	5.950	116.04	8.950	3.08	11.95	1.76
2.967	2.64	5.967	116.04	8.967	3.08	11.97	1.76
2.983	2.64	5.983	116.04	8.983	3.08	11.98	1.76
3.000	2.64	6.000	115.90	9.000	3.08	12.00	1.76

Max.Eff.Inten.(mm/hr)=	116.04	36.98	
over (min)	5.00	9.00	
Storage Coeff. (min)=	2.60 (ii)	8.15 (ii)	
Unit Hyd. Tpeak (min)=	5.00	9.00	
Unit Hyd. peak (cms)=	0.33	0.13	
			TOTALS
PEAK FLOW (cms)=	0.48	0.10	0.565 (iii)
TIME TO PEAK (hrs)=	6.00	6.07	6.00
RUNOFF VOLUME (mm)=	86.91	20.43	54.33
TOTAL RAINFALL (mm)=	87.91	87.91	87.91
RUNOFF COEFFICIENT =	0.99	0.23	0.62

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0028)|   Area    (ha)=   0.29
|ID= 1 DT= 1.0 min |   Total Imp(%)=  67.00   Dir. Conn.(%)=  67.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.10
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      43.97        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    2.20 | 3.017    3.52 | 6.017   15.82 |  9.02    3.08
 0.033    2.20 | 3.033    3.52 | 6.033   15.82 |  9.03    3.08
 0.050    2.20 | 3.050    3.52 | 6.050   15.82 |  9.05    3.08
 0.067    2.20 | 3.067    3.52 | 6.067   15.82 |  9.07    3.08
 0.083    2.20 | 3.083    3.52 | 6.083   15.82 |  9.08    3.08
 0.100    2.20 | 3.100    3.52 | 6.100   15.82 |  9.10    3.08
 0.117    2.20 | 3.117    3.52 | 6.117   15.82 |  9.12    3.08
 0.133    2.20 | 3.133    3.52 | 6.133   15.82 |  9.13    3.08
 0.150    2.20 | 3.150    3.52 | 6.150   15.82 |  9.15    3.08
 0.167    2.20 | 3.167    3.52 | 6.167   15.82 |  9.17    3.08
 0.183    2.20 | 3.183    3.52 | 6.183   15.82 |  9.18    3.08
 0.200    2.20 | 3.200    3.52 | 6.200   15.82 |  9.20    3.08
 0.217    2.20 | 3.217    3.52 | 6.217   15.82 |  9.22    3.08
 0.233    2.20 | 3.233    3.52 | 6.233   15.82 |  9.23    3.08
 0.250    2.20 | 3.250    3.52 | 6.250   15.82 |  9.25    3.08
 0.267    2.20 | 3.267    3.52 | 6.267   15.82 |  9.27    3.08
 0.283    2.20 | 3.283    3.52 | 6.283   15.82 |  9.28    3.08
 0.300    2.20 | 3.300    3.52 | 6.300   15.82 |  9.30    3.08
 0.317    2.20 | 3.317    3.52 | 6.317   15.82 |  9.32    3.08
 0.333    2.20 | 3.333    3.52 | 6.333   15.82 |  9.33    3.08
 0.350    2.20 | 3.350    3.52 | 6.350   15.82 |  9.35    3.08
 0.367    2.20 | 3.367    3.52 | 6.367   15.82 |  9.37    3.08
 0.383    2.20 | 3.383    3.52 | 6.383   15.82 |  9.38    3.08
 0.400    2.20 | 3.400    3.52 | 6.400   15.82 |  9.40    3.08
 0.417    2.20 | 3.417    3.52 | 6.417   15.82 |  9.42    3.08
 0.433    2.20 | 3.433    3.52 | 6.433   15.82 |  9.43    3.08
 0.450    2.20 | 3.450    3.52 | 6.450   15.82 |  9.45    3.08
 0.467    2.20 | 3.467    3.52 | 6.467   15.82 |  9.47    3.08
 0.483    2.20 | 3.483    3.52 | 6.483   15.82 |  9.48    3.08
 0.500    2.20 | 3.500    3.52 | 6.500   15.81 |  9.50    3.08
 0.517    2.20 | 3.517    3.52 | 6.517    7.03 |  9.52    3.08
 0.533    2.20 | 3.533    3.52 | 6.533    7.03 |  9.53    3.08
 0.550    2.20 | 3.550    3.52 | 6.550    7.03 |  9.55    3.08
 0.567    2.20 | 3.567    3.52 | 6.567    7.03 |  9.57    3.08
 0.583    2.20 | 3.583    3.52 | 6.583    7.03 |  9.58    3.08
 0.600    2.20 | 3.600    3.52 | 6.600    7.03 |  9.60    3.08
 0.617    2.20 | 3.617    3.52 | 6.617    7.03 |  9.62    3.08
 0.633    2.20 | 3.633    3.52 | 6.633    7.03 |  9.63    3.08
 0.650    2.20 | 3.650    3.52 | 6.650    7.03 |  9.65    3.08
 0.667    2.20 | 3.667    3.52 | 6.667    7.03 |  9.67    3.08
 0.683    2.20 | 3.683    3.52 | 6.683    7.03 |  9.68    3.08
 0.700    2.20 | 3.700    3.52 | 6.700    7.03 |  9.70    3.08
 0.717    2.20 | 3.717    3.52 | 6.717    7.03 |  9.72    3.08
 0.733    2.20 | 3.733    3.52 | 6.733    7.03 |  9.73    3.08
 0.750    2.20 | 3.750    3.52 | 6.750    7.03 |  9.75    3.08
 0.767    2.20 | 3.767    3.52 | 6.767    7.03 |  9.77    3.08
 0.783    2.20 | 3.783    3.52 | 6.783    7.03 |  9.78    3.08
 0.800    2.20 | 3.800    3.52 | 6.800    7.03 |  9.80    3.08
 0.817    2.20 | 3.817    3.52 | 6.817    7.03 |  9.82    3.08
 0.833    2.20 | 3.833    3.52 | 6.833    7.03 |  9.83    3.08
 0.850    2.20 | 3.850    3.52 | 6.850    7.03 |  9.85    3.08
 0.867    2.20 | 3.867    3.52 | 6.867    7.03 |  9.87    3.08
 0.883    2.20 | 3.883    3.52 | 6.883    7.03 |  9.88    3.08
 0.900    2.20 | 3.900    3.52 | 6.900    7.03 |  9.90    3.08
 0.917    2.20 | 3.917    3.52 | 6.917    7.03 |  9.92    3.08
 0.933    2.20 | 3.933    3.52 | 6.933    7.03 |  9.93    3.08
 0.950    2.20 | 3.950    3.52 | 6.950    7.03 |  9.95    3.08
 0.967    2.20 | 3.967    3.52 | 6.967    7.03 |  9.97    3.08
 0.983    2.20 | 3.983    3.52 | 6.983    7.03 |  9.98    3.08
```

1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76
1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76
1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76
1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76
1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76
2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76
2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76

2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76
2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.683	2.64	5.683	42.20	8.683	3.08	11.68	1.76
2.700	2.64	5.700	42.20	8.700	3.08	11.70	1.76
2.717	2.64	5.717	42.20	8.717	3.08	11.72	1.76
2.733	2.64	5.733	42.20	8.733	3.08	11.73	1.76
2.750	2.64	5.750	42.29	8.750	3.08	11.75	1.76
2.767	2.64	5.767	116.04	8.767	3.08	11.77	1.76
2.783	2.64	5.783	116.04	8.783	3.08	11.78	1.76
2.800	2.64	5.800	116.04	8.800	3.08	11.80	1.76
2.817	2.64	5.817	116.04	8.817	3.08	11.82	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.850	2.64	5.850	116.04	8.850	3.08	11.85	1.76
2.867	2.64	5.867	116.04	8.867	3.08	11.87	1.76
2.883	2.64	5.883	116.04	8.883	3.08	11.88	1.76
2.900	2.64	5.900	116.04	8.900	3.08	11.90	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
2.933	2.64	5.933	116.04	8.933	3.08	11.93	1.76
2.950	2.64	5.950	116.04	8.950	3.08	11.95	1.76
2.967	2.64	5.967	116.04	8.967	3.08	11.97	1.76
2.983	2.64	5.983	116.04	8.983	3.08	11.98	1.76
3.000	2.64	6.000	115.90	9.000	3.08	12.00	1.76

Max.Eff.Inten.(mm/hr)=	116.04	30.27		
over (min)	5.00	7.00		
Storage Coeff. (min)=	1.47 (ii)	6.48 (ii)		
Unit Hyd. Tpeak (min)=	5.00	7.00		
Unit Hyd. peak (cms)=	0.42	0.17		
			TOTALS	
PEAK FLOW (cms)=	0.06	0.01	0.069 (iii)	
TIME TO PEAK (hrs)=	6.00	6.03	6.00	
RUNOFF VOLUME (mm)=	86.91	18.61	64.36	
TOTAL RAINFALL (mm)=	87.91	87.91	87.91	
RUNOFF COEFFICIENT =	0.99	0.21	0.73	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0016)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0001):	2.91	0.565	6.00	54.33	
+ ID2= 2 (0025):	1.43	0.096	6.23	33.05	
ID = 3 (0016):	4.34	0.623	6.00	47.32	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0016)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.

```
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.623     6.00    47.32
      + ID2= 2 (  0028):     0.29   0.069     6.00    64.36
        ================================================
        ID = 1 (  0016):     4.63   0.692     6.00    48.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0130      0.0895
                          0.0000     0.0291    |   0.0210      0.1555
                          0.0010     0.0332    |   0.0230      0.1780
                          0.0040     0.0496    |   0.0280      0.2176
                          0.0050     0.0537    |   0.0300      0.2309

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0016)      4.630      0.692      6.00      48.39
   OUTFLOW: ID= 1 (  0003)      4.630      0.023     10.08      34.94

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.33
                  TIME SHIFT OF PEAK FLOW         (min)=245.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1780

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0026)|   Area    (ha)=   0.27   Curve Number   (CN)= 71.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   3.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.02

         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    2.20 | 3.017    3.52 | 6.017   15.82 |  9.02    3.08
               0.033    2.20 | 3.033    3.52 | 6.033   15.82 |  9.03    3.08
               0.050    2.20 | 3.050    3.52 | 6.050   15.82 |  9.05    3.08
               0.067    2.20 | 3.067    3.52 | 6.067   15.82 |  9.07    3.08
               0.083    2.20 | 3.083    3.52 | 6.083   15.82 |  9.08    3.08
               0.100    2.20 | 3.100    3.52 | 6.100   15.82 |  9.10    3.08
               0.117    2.20 | 3.117    3.52 | 6.117   15.82 |  9.12    3.08
               0.133    2.20 | 3.133    3.52 | 6.133   15.82 |  9.13    3.08
               0.150    2.20 | 3.150    3.52 | 6.150   15.82 |  9.15    3.08
               0.167    2.20 | 3.167    3.52 | 6.167   15.82 |  9.17    3.08
               0.183    2.20 | 3.183    3.52 | 6.183   15.82 |  9.18    3.08
               0.200    2.20 | 3.200    3.52 | 6.200   15.82 |  9.20    3.08
               0.217    2.20 | 3.217    3.52 | 6.217   15.82 |  9.22    3.08
               0.233    2.20 | 3.233    3.52 | 6.233   15.82 |  9.23    3.08
               0.250    2.20 | 3.250    3.52 | 6.250   15.82 |  9.25    3.08
               0.267    2.20 | 3.267    3.52 | 6.267   15.82 |  9.27    3.08
               0.283    2.20 | 3.283    3.52 | 6.283   15.82 |  9.28    3.08
               0.300    2.20 | 3.300    3.52 | 6.300   15.82 |  9.30    3.08
               0.317    2.20 | 3.317    3.52 | 6.317   15.82 |  9.32    3.08
               0.333    2.20 | 3.333    3.52 | 6.333   15.82 |  9.33    3.08
               0.350    2.20 | 3.350    3.52 | 6.350   15.82 |  9.35    3.08
               0.367    2.20 | 3.367    3.52 | 6.367   15.82 |  9.37    3.08
               0.383    2.20 | 3.383    3.52 | 6.383   15.82 |  9.38    3.08
               0.400    2.20 | 3.400    3.52 | 6.400   15.82 |  9.40    3.08
               0.417    2.20 | 3.417    3.52 | 6.417   15.82 |  9.42    3.08
               0.433    2.20 | 3.433    3.52 | 6.433   15.82 |  9.43    3.08
               0.450    2.20 | 3.450    3.52 | 6.450   15.82 |  9.45    3.08
               0.467    2.20 | 3.467    3.52 | 6.467   15.82 |  9.47    3.08
               0.483    2.20 | 3.483    3.52 | 6.483   15.82 |  9.48    3.08
               0.500    2.20 | 3.500    3.52 | 6.500   15.81 |  9.50    3.08
               0.517    2.20 | 3.517    3.52 | 6.517    7.03 |  9.52    3.08
               0.533    2.20 | 3.533    3.52 | 6.533    7.03 |  9.53    3.08
               0.550    2.20 | 3.550    3.52 | 6.550    7.03 |  9.55    3.08
               0.567    2.20 | 3.567    3.52 | 6.567    7.03 |  9.57    3.08
               0.583    2.20 | 3.583    3.52 | 6.583    7.03 |  9.58    3.08
               0.600    2.20 | 3.600    3.52 | 6.600    7.03 |  9.60    3.08
               0.617    2.20 | 3.617    3.52 | 6.617    7.03 |  9.62    3.08
               0.633    2.20 | 3.633    3.52 | 6.633    7.03 |  9.63    3.08
```

0.650	2.20	3.650	3.52	6.650	7.03	9.65	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.683	2.20	3.683	3.52	6.683	7.03	9.68	3.08
0.700	2.20	3.700	3.52	6.700	7.03	9.70	3.08
0.717	2.20	3.717	3.52	6.717	7.03	9.72	3.08
0.733	2.20	3.733	3.52	6.733	7.03	9.73	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.767	2.20	3.767	3.52	6.767	7.03	9.77	3.08
0.783	2.20	3.783	3.52	6.783	7.03	9.78	3.08
0.800	2.20	3.800	3.52	6.800	7.03	9.80	3.08
0.817	2.20	3.817	3.52	6.817	7.03	9.82	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.850	2.20	3.850	3.52	6.850	7.03	9.85	3.08
0.867	2.20	3.867	3.52	6.867	7.03	9.87	3.08
0.883	2.20	3.883	3.52	6.883	7.03	9.88	3.08
0.900	2.20	3.900	3.52	6.900	7.03	9.90	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
0.933	2.20	3.933	3.52	6.933	7.03	9.93	3.08
0.950	2.20	3.950	3.52	6.950	7.03	9.95	3.08
0.967	2.20	3.967	3.52	6.967	7.03	9.97	3.08
0.983	2.20	3.983	3.52	6.983	7.03	9.98	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76
1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76
1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76
1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76

1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76
2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76
2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76
2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76
2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.683	2.64	5.683	42.20	8.683	3.08	11.68	1.76
2.700	2.64	5.700	42.20	8.700	3.08	11.70	1.76
2.717	2.64	5.717	42.20	8.717	3.08	11.72	1.76
2.733	2.64	5.733	42.20	8.733	3.08	11.73	1.76
2.750	2.64	5.750	42.29	8.750	3.08	11.75	1.76
2.767	2.64	5.767	116.04	8.767	3.08	11.77	1.76
2.783	2.64	5.783	116.04	8.783	3.08	11.78	1.76
2.800	2.64	5.800	116.04	8.800	3.08	11.80	1.76
2.817	2.64	5.817	116.04	8.817	3.08	11.82	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.850	2.64	5.850	116.04	8.850	3.08	11.85	1.76
2.867	2.64	5.867	116.04	8.867	3.08	11.87	1.76
2.883	2.64	5.883	116.04	8.883	3.08	11.88	1.76
2.900	2.64	5.900	116.04	8.900	3.08	11.90	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
2.933	2.64	5.933	116.04	8.933	3.08	11.93	1.76
2.950	2.64	5.950	116.04	8.950	3.08	11.95	1.76
2.967	2.64	5.967	116.04	8.967	3.08	11.97	1.76
2.983	2.64	5.983	116.04	8.983	3.08	11.98	1.76
3.000	2.64	6.000	115.90	9.000	3.08	12.00	1.76

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.049 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 37.223
TOTAL RAINFALL (mm)= 87.909
RUNOFF COEFFICIENT = 0.423

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

CALIB	
STANDHYD (0007)	Area (ha)= 1.75
ID= 1 DT= 1.0 min	Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	2.20	3.017	3.52	6.017	15.82	9.02	3.08
0.033	2.20	3.033	3.52	6.033	15.82	9.03	3.08
0.050	2.20	3.050	3.52	6.050	15.82	9.05	3.08
0.067	2.20	3.067	3.52	6.067	15.82	9.07	3.08
0.083	2.20	3.083	3.52	6.083	15.82	9.08	3.08
0.100	2.20	3.100	3.52	6.100	15.82	9.10	3.08
0.117	2.20	3.117	3.52	6.117	15.82	9.12	3.08
0.133	2.20	3.133	3.52	6.133	15.82	9.13	3.08
0.150	2.20	3.150	3.52	6.150	15.82	9.15	3.08
0.167	2.20	3.167	3.52	6.167	15.82	9.17	3.08
0.183	2.20	3.183	3.52	6.183	15.82	9.18	3.08
0.200	2.20	3.200	3.52	6.200	15.82	9.20	3.08
0.217	2.20	3.217	3.52	6.217	15.82	9.22	3.08
0.233	2.20	3.233	3.52	6.233	15.82	9.23	3.08
0.250	2.20	3.250	3.52	6.250	15.82	9.25	3.08
0.267	2.20	3.267	3.52	6.267	15.82	9.27	3.08
0.283	2.20	3.283	3.52	6.283	15.82	9.28	3.08
0.300	2.20	3.300	3.52	6.300	15.82	9.30	3.08
0.317	2.20	3.317	3.52	6.317	15.82	9.32	3.08
0.333	2.20	3.333	3.52	6.333	15.82	9.33	3.08
0.350	2.20	3.350	3.52	6.350	15.82	9.35	3.08
0.367	2.20	3.367	3.52	6.367	15.82	9.37	3.08
0.383	2.20	3.383	3.52	6.383	15.82	9.38	3.08
0.400	2.20	3.400	3.52	6.400	15.82	9.40	3.08
0.417	2.20	3.417	3.52	6.417	15.82	9.42	3.08
0.433	2.20	3.433	3.52	6.433	15.82	9.43	3.08
0.450	2.20	3.450	3.52	6.450	15.82	9.45	3.08
0.467	2.20	3.467	3.52	6.467	15.82	9.47	3.08
0.483	2.20	3.483	3.52	6.483	15.82	9.48	3.08
0.500	2.20	3.500	3.52	6.500	15.81	9.50	3.08
0.517	2.20	3.517	3.52	6.517	7.03	9.52	3.08
0.533	2.20	3.533	3.52	6.533	7.03	9.53	3.08
0.550	2.20	3.550	3.52	6.550	7.03	9.55	3.08
0.567	2.20	3.567	3.52	6.567	7.03	9.57	3.08
0.583	2.20	3.583	3.52	6.583	7.03	9.58	3.08
0.600	2.20	3.600	3.52	6.600	7.03	9.60	3.08
0.617	2.20	3.617	3.52	6.617	7.03	9.62	3.08
0.633	2.20	3.633	3.52	6.633	7.03	9.63	3.08
0.650	2.20	3.650	3.52	6.650	7.03	9.65	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.683	2.20	3.683	3.52	6.683	7.03	9.68	3.08
0.700	2.20	3.700	3.52	6.700	7.03	9.70	3.08
0.717	2.20	3.717	3.52	6.717	7.03	9.72	3.08
0.733	2.20	3.733	3.52	6.733	7.03	9.73	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.767	2.20	3.767	3.52	6.767	7.03	9.77	3.08
0.783	2.20	3.783	3.52	6.783	7.03	9.78	3.08
0.800	2.20	3.800	3.52	6.800	7.03	9.80	3.08
0.817	2.20	3.817	3.52	6.817	7.03	9.82	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.850	2.20	3.850	3.52	6.850	7.03	9.85	3.08
0.867	2.20	3.867	3.52	6.867	7.03	9.87	3.08
0.883	2.20	3.883	3.52	6.883	7.03	9.88	3.08
0.900	2.20	3.900	3.52	6.900	7.03	9.90	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
0.933	2.20	3.933	3.52	6.933	7.03	9.93	3.08
0.950	2.20	3.950	3.52	6.950	7.03	9.95	3.08
0.967	2.20	3.967	3.52	6.967	7.03	9.97	3.08
0.983	2.20	3.983	3.52	6.983	7.03	9.98	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76

1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76
1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76
1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76
1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76
1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76
2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76
2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76
2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76

2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76
2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.683	2.64	5.683	42.20	8.683	3.08	11.68	1.76
2.700	2.64	5.700	42.20	8.700	3.08	11.70	1.76
2.717	2.64	5.717	42.20	8.717	3.08	11.72	1.76
2.733	2.64	5.733	42.20	8.733	3.08	11.73	1.76
2.750	2.64	5.750	42.29	8.750	3.08	11.75	1.76
2.767	2.64	5.767	116.04	8.767	3.08	11.77	1.76
2.783	2.64	5.783	116.04	8.783	3.08	11.78	1.76
2.800	2.64	5.800	116.04	8.800	3.08	11.80	1.76
2.817	2.64	5.817	116.04	8.817	3.08	11.82	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.850	2.64	5.850	116.04	8.850	3.08	11.85	1.76
2.867	2.64	5.867	116.04	8.867	3.08	11.87	1.76
2.883	2.64	5.883	116.04	8.883	3.08	11.88	1.76
2.900	2.64	5.900	116.04	8.900	3.08	11.90	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
2.933	2.64	5.933	116.04	8.933	3.08	11.93	1.76
2.950	2.64	5.950	116.04	8.950	3.08	11.95	1.76
2.967	2.64	5.967	116.04	8.967	3.08	11.97	1.76
2.983	2.64	5.983	116.04	8.983	3.08	11.98	1.76
3.000	2.64	6.000	115.90	9.000	3.08	12.00	1.76

Max.Eff.Inten.(mm/hr)=	116.04	40.28		
over (min)	5.00	9.00		
Storage Coeff. (min)=	2.52 (ii)	8.67 (ii)		
Unit Hyd. Tpeak (min)=	5.00	9.00		
Unit Hyd. peak (cms)=	0.34	0.13		
			TOTALS	
PEAK FLOW (cms)=	0.29	0.06	0.341 (iii)	
TIME TO PEAK (hrs)=	6.00	6.07	6.00	
RUNOFF VOLUME (mm)=	86.91	21.24	54.73	
TOTAL RAINFALL (mm)=	87.91	87.91	87.91	
RUNOFF COEFFICIENT =	0.99	0.24	0.62	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0018)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0026):	0.27	0.049	6.00	37.22	
+ ID2= 2 (0007):	1.75	0.341	6.00	54.73	
ID = 3 (0018):	2.02	0.390	6.00	52.39	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0009)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0007	0.0212	0.0291
	0.0037	0.0045	0.0402	0.0316
	0.0053	0.0065	0.1203	0.0341
	0.0081	0.0128	0.2476	0.0366
	0.0101	0.0188	0.3901	0.0373

```
                        0.0118     0.0250   |   0.4841      0.0381
                        0.0126     0.0279   |   0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020     0.390      6.00      52.39
   OUTFLOW: ID= 1 (  0009)      2.020     0.384      6.00      51.92

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 98.52
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0373

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.95

         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    2.20 | 3.017    3.52 | 6.017   15.82 |  9.02    3.08
                 0.033    2.20 | 3.033    3.52 | 6.033   15.82 |  9.03    3.08
                 0.050    2.20 | 3.050    3.52 | 6.050   15.82 |  9.05    3.08
                 0.067    2.20 | 3.067    3.52 | 6.067   15.82 |  9.07    3.08
                 0.083    2.20 | 3.083    3.52 | 6.083   15.82 |  9.08    3.08
                 0.100    2.20 | 3.100    3.52 | 6.100   15.82 |  9.10    3.08
                 0.117    2.20 | 3.117    3.52 | 6.117   15.82 |  9.12    3.08
                 0.133    2.20 | 3.133    3.52 | 6.133   15.82 |  9.13    3.08
                 0.150    2.20 | 3.150    3.52 | 6.150   15.82 |  9.15    3.08
                 0.167    2.20 | 3.167    3.52 | 6.167   15.82 |  9.17    3.08
                 0.183    2.20 | 3.183    3.52 | 6.183   15.82 |  9.18    3.08
                 0.200    2.20 | 3.200    3.52 | 6.200   15.82 |  9.20    3.08
                 0.217    2.20 | 3.217    3.52 | 6.217   15.82 |  9.22    3.08
                 0.233    2.20 | 3.233    3.52 | 6.233   15.82 |  9.23    3.08
                 0.250    2.20 | 3.250    3.52 | 6.250   15.82 |  9.25    3.08
                 0.267    2.20 | 3.267    3.52 | 6.267   15.82 |  9.27    3.08
                 0.283    2.20 | 3.283    3.52 | 6.283   15.82 |  9.28    3.08
                 0.300    2.20 | 3.300    3.52 | 6.300   15.82 |  9.30    3.08
                 0.317    2.20 | 3.317    3.52 | 6.317   15.82 |  9.32    3.08
                 0.333    2.20 | 3.333    3.52 | 6.333   15.82 |  9.33    3.08
                 0.350    2.20 | 3.350    3.52 | 6.350   15.82 |  9.35    3.08
                 0.367    2.20 | 3.367    3.52 | 6.367   15.82 |  9.37    3.08
                 0.383    2.20 | 3.383    3.52 | 6.383   15.82 |  9.38    3.08
                 0.400    2.20 | 3.400    3.52 | 6.400   15.82 |  9.40    3.08
                 0.417    2.20 | 3.417    3.52 | 6.417   15.82 |  9.42    3.08
                 0.433    2.20 | 3.433    3.52 | 6.433   15.82 |  9.43    3.08
                 0.450    2.20 | 3.450    3.52 | 6.450   15.82 |  9.45    3.08
                 0.467    2.20 | 3.467    3.52 | 6.467   15.82 |  9.47    3.08
                 0.483    2.20 | 3.483    3.52 | 6.483   15.82 |  9.48    3.08
                 0.500    2.20 | 3.500    3.52 | 6.500   15.81 |  9.50    3.08
                 0.517    2.20 | 3.517    3.52 | 6.517    7.03 |  9.52    3.08
                 0.533    2.20 | 3.533    3.52 | 6.533    7.03 |  9.53    3.08
                 0.550    2.20 | 3.550    3.52 | 6.550    7.03 |  9.55    3.08
                 0.567    2.20 | 3.567    3.52 | 6.567    7.03 |  9.57    3.08
                 0.583    2.20 | 3.583    3.52 | 6.583    7.03 |  9.58    3.08
                 0.600    2.20 | 3.600    3.52 | 6.600    7.03 |  9.60    3.08
                 0.617    2.20 | 3.617    3.52 | 6.617    7.03 |  9.62    3.08
                 0.633    2.20 | 3.633    3.52 | 6.633    7.03 |  9.63    3.08
                 0.650    2.20 | 3.650    3.52 | 6.650    7.03 |  9.65    3.08
                 0.667    2.20 | 3.667    3.52 | 6.667    7.03 |  9.67    3.08
                 0.683    2.20 | 3.683    3.52 | 6.683    7.03 |  9.68    3.08
                 0.700    2.20 | 3.700    3.52 | 6.700    7.03 |  9.70    3.08
                 0.717    2.20 | 3.717    3.52 | 6.717    7.03 |  9.72    3.08
                 0.733    2.20 | 3.733    3.52 | 6.733    7.03 |  9.73    3.08
                 0.750    2.20 | 3.750    3.52 | 6.750    7.03 |  9.75    3.08
                 0.767    2.20 | 3.767    3.52 | 6.767    7.03 |  9.77    3.08
                 0.783    2.20 | 3.783    3.52 | 6.783    7.03 |  9.78    3.08
                 0.800    2.20 | 3.800    3.52 | 6.800    7.03 |  9.80    3.08
                 0.817    2.20 | 3.817    3.52 | 6.817    7.03 |  9.82    3.08
                 0.833    2.20 | 3.833    3.52 | 6.833    7.03 |  9.83    3.08
                 0.850    2.20 | 3.850    3.52 | 6.850    7.03 |  9.85    3.08
                 0.867    2.20 | 3.867    3.52 | 6.867    7.03 |  9.87    3.08
                 0.883    2.20 | 3.883    3.52 | 6.883    7.03 |  9.88    3.08
                 0.900    2.20 | 3.900    3.52 | 6.900    7.03 |  9.90    3.08
```

0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
0.933	2.20	3.933	3.52	6.933	7.03	9.93	3.08
0.950	2.20	3.950	3.52	6.950	7.03	9.95	3.08
0.967	2.20	3.967	3.52	6.967	7.03	9.97	3.08
0.983	2.20	3.983	3.52	6.983	7.03	9.98	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76
1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76
1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76
1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76
1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76
2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76

2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76
2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76
2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.683	2.64	5.683	42.20	8.683	3.08	11.68	1.76
2.700	2.64	5.700	42.20	8.700	3.08	11.70	1.76
2.717	2.64	5.717	42.20	8.717	3.08	11.72	1.76
2.733	2.64	5.733	42.20	8.733	3.08	11.73	1.76
2.750	2.64	5.750	42.29	8.750	3.08	11.75	1.76
2.767	2.64	5.767	116.04	8.767	3.08	11.77	1.76
2.783	2.64	5.783	116.04	8.783	3.08	11.78	1.76
2.800	2.64	5.800	116.04	8.800	3.08	11.80	1.76
2.817	2.64	5.817	116.04	8.817	3.08	11.82	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.850	2.64	5.850	116.04	8.850	3.08	11.85	1.76
2.867	2.64	5.867	116.04	8.867	3.08	11.87	1.76
2.883	2.64	5.883	116.04	8.883	3.08	11.88	1.76
2.900	2.64	5.900	116.04	8.900	3.08	11.90	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
2.933	2.64	5.933	116.04	8.933	3.08	11.93	1.76
2.950	2.64	5.950	116.04	8.950	3.08	11.95	1.76
2.967	2.64	5.967	116.04	8.967	3.08	11.97	1.76
2.983	2.64	5.983	116.04	8.983	3.08	11.98	1.76
3.000	2.64	6.000	115.90	9.000	3.08	12.00	1.76

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.429 (i)
TIME TO PEAK (hrs)= 6.967
RUNOFF VOLUME (mm)= 27.684
TOTAL RAINFALL (mm)= 87.909
RUNOFF COEFFICIENT = 0.315

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

CALIB
STANDHYD (0006) | Area (ha)= 0.75
ID= 1 DT= 1.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	2.20	3.017	3.52	6.017	15.82	9.02	3.08
0.033	2.20	3.033	3.52	6.033	15.82	9.03	3.08

0.050	2.20	3.050	3.52	6.050	15.82	9.05	3.08
0.067	2.20	3.067	3.52	6.067	15.82	9.07	3.08
0.083	2.20	3.083	3.52	6.083	15.82	9.08	3.08
0.100	2.20	3.100	3.52	6.100	15.82	9.10	3.08
0.117	2.20	3.117	3.52	6.117	15.82	9.12	3.08
0.133	2.20	3.133	3.52	6.133	15.82	9.13	3.08
0.150	2.20	3.150	3.52	6.150	15.82	9.15	3.08
0.167	2.20	3.167	3.52	6.167	15.82	9.17	3.08
0.183	2.20	3.183	3.52	6.183	15.82	9.18	3.08
0.200	2.20	3.200	3.52	6.200	15.82	9.20	3.08
0.217	2.20	3.217	3.52	6.217	15.82	9.22	3.08
0.233	2.20	3.233	3.52	6.233	15.82	9.23	3.08
0.250	2.20	3.250	3.52	6.250	15.82	9.25	3.08
0.267	2.20	3.267	3.52	6.267	15.82	9.27	3.08
0.283	2.20	3.283	3.52	6.283	15.82	9.28	3.08
0.300	2.20	3.300	3.52	6.300	15.82	9.30	3.08
0.317	2.20	3.317	3.52	6.317	15.82	9.32	3.08
0.333	2.20	3.333	3.52	6.333	15.82	9.33	3.08
0.350	2.20	3.350	3.52	6.350	15.82	9.35	3.08
0.367	2.20	3.367	3.52	6.367	15.82	9.37	3.08
0.383	2.20	3.383	3.52	6.383	15.82	9.38	3.08
0.400	2.20	3.400	3.52	6.400	15.82	9.40	3.08
0.417	2.20	3.417	3.52	6.417	15.82	9.42	3.08
0.433	2.20	3.433	3.52	6.433	15.82	9.43	3.08
0.450	2.20	3.450	3.52	6.450	15.82	9.45	3.08
0.467	2.20	3.467	3.52	6.467	15.82	9.47	3.08
0.483	2.20	3.483	3.52	6.483	15.82	9.48	3.08
0.500	2.20	3.500	3.52	6.500	15.81	9.50	3.08
0.517	2.20	3.517	3.52	6.517	7.03	9.52	3.08
0.533	2.20	3.533	3.52	6.533	7.03	9.53	3.08
0.550	2.20	3.550	3.52	6.550	7.03	9.55	3.08
0.567	2.20	3.567	3.52	6.567	7.03	9.57	3.08
0.583	2.20	3.583	3.52	6.583	7.03	9.58	3.08
0.600	2.20	3.600	3.52	6.600	7.03	9.60	3.08
0.617	2.20	3.617	3.52	6.617	7.03	9.62	3.08
0.633	2.20	3.633	3.52	6.633	7.03	9.63	3.08
0.650	2.20	3.650	3.52	6.650	7.03	9.65	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.683	2.20	3.683	3.52	6.683	7.03	9.68	3.08
0.700	2.20	3.700	3.52	6.700	7.03	9.70	3.08
0.717	2.20	3.717	3.52	6.717	7.03	9.72	3.08
0.733	2.20	3.733	3.52	6.733	7.03	9.73	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.767	2.20	3.767	3.52	6.767	7.03	9.77	3.08
0.783	2.20	3.783	3.52	6.783	7.03	9.78	3.08
0.800	2.20	3.800	3.52	6.800	7.03	9.80	3.08
0.817	2.20	3.817	3.52	6.817	7.03	9.82	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.850	2.20	3.850	3.52	6.850	7.03	9.85	3.08
0.867	2.20	3.867	3.52	6.867	7.03	9.87	3.08
0.883	2.20	3.883	3.52	6.883	7.03	9.88	3.08
0.900	2.20	3.900	3.52	6.900	7.03	9.90	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
0.933	2.20	3.933	3.52	6.933	7.03	9.93	3.08
0.950	2.20	3.950	3.52	6.950	7.03	9.95	3.08
0.967	2.20	3.967	3.52	6.967	7.03	9.97	3.08
0.983	2.20	3.983	3.52	6.983	7.03	9.98	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76
1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76

1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76
1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76
1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76
2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76
2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76
2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76
2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76

```
                2.683    2.64 | 5.683   42.20 | 8.683    3.08 | 11.68    1.76
                2.700    2.64 | 5.700   42.20 | 8.700    3.08 | 11.70    1.76
                2.717    2.64 | 5.717   42.20 | 8.717    3.08 | 11.72    1.76
                2.733    2.64 | 5.733   42.20 | 8.733    3.08 | 11.73    1.76
                2.750    2.64 | 5.750   42.29 | 8.750    3.08 | 11.75    1.76
                2.767    2.64 | 5.767  116.04 | 8.767    3.08 | 11.77    1.76
                2.783    2.64 | 5.783  116.04 | 8.783    3.08 | 11.78    1.76
                2.800    2.64 | 5.800  116.04 | 8.800    3.08 | 11.80    1.76
                2.817    2.64 | 5.817  116.04 | 8.817    3.08 | 11.82    1.76
                2.833    2.64 | 5.833  116.04 | 8.833    3.08 | 11.83    1.76
                2.850    2.64 | 5.850  116.04 | 8.850    3.08 | 11.85    1.76
                2.867    2.64 | 5.867  116.04 | 8.867    3.08 | 11.87    1.76
                2.883    2.64 | 5.883  116.04 | 8.883    3.08 | 11.88    1.76
                2.900    2.64 | 5.900  116.04 | 8.900    3.08 | 11.90    1.76
                2.917    2.64 | 5.917  116.04 | 8.917    3.08 | 11.92    1.76
                2.933    2.64 | 5.933  116.04 | 8.933    3.08 | 11.93    1.76
                2.950    2.64 | 5.950  116.04 | 8.950    3.08 | 11.95    1.76
                2.967    2.64 | 5.967  116.04 | 8.967    3.08 | 11.97    1.76
                2.983    2.64 | 5.983  116.04 | 8.983    3.08 | 11.98    1.76
                3.000    2.64 | 6.000  115.90 | 9.000    3.08 | 12.00    1.76

     Max.Eff.Inten.(mm/hr)=     116.04       158.33
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      1.96 (ii)    4.94 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.38         0.23
                                                          *TOTALS*
     PEAK FLOW       (cms)=      0.18         0.03          0.209 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.02          6.00
     RUNOFF VOLUME    (mm)=     86.91        37.69         74.11
     TOTAL RAINFALL   (mm)=     87.91        87.91         87.91
     RUNOFF COEFFICIENT   =      0.99         0.43          0.84


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0011)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0912      0.0179
                          0.0006     0.0005   |   0.1027      0.0204
                          0.0062     0.0056   |   0.1264      0.0248
                          0.0100     0.0060   |   0.1349      0.0263
                          0.0470     0.0101   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0006)      0.750     0.209      6.00      74.11
   OUTFLOW: ID= 1 (  0011)      0.750     0.103      6.08      73.83

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 49.16
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0204

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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	2.20	3.017	3.52	6.017	15.82	9.02	3.08
0.033	2.20	3.033	3.52	6.033	15.82	9.03	3.08
0.050	2.20	3.050	3.52	6.050	15.82	9.05	3.08
0.067	2.20	3.067	3.52	6.067	15.82	9.07	3.08
0.083	2.20	3.083	3.52	6.083	15.82	9.08	3.08
0.100	2.20	3.100	3.52	6.100	15.82	9.10	3.08
0.117	2.20	3.117	3.52	6.117	15.82	9.12	3.08
0.133	2.20	3.133	3.52	6.133	15.82	9.13	3.08
0.150	2.20	3.150	3.52	6.150	15.82	9.15	3.08
0.167	2.20	3.167	3.52	6.167	15.82	9.17	3.08
0.183	2.20	3.183	3.52	6.183	15.82	9.18	3.08
0.200	2.20	3.200	3.52	6.200	15.82	9.20	3.08
0.217	2.20	3.217	3.52	6.217	15.82	9.22	3.08
0.233	2.20	3.233	3.52	6.233	15.82	9.23	3.08
0.250	2.20	3.250	3.52	6.250	15.82	9.25	3.08
0.267	2.20	3.267	3.52	6.267	15.82	9.27	3.08
0.283	2.20	3.283	3.52	6.283	15.82	9.28	3.08
0.300	2.20	3.300	3.52	6.300	15.82	9.30	3.08
0.317	2.20	3.317	3.52	6.317	15.82	9.32	3.08
0.333	2.20	3.333	3.52	6.333	15.82	9.33	3.08
0.350	2.20	3.350	3.52	6.350	15.82	9.35	3.08
0.367	2.20	3.367	3.52	6.367	15.82	9.37	3.08
0.383	2.20	3.383	3.52	6.383	15.82	9.38	3.08
0.400	2.20	3.400	3.52	6.400	15.82	9.40	3.08
0.417	2.20	3.417	3.52	6.417	15.82	9.42	3.08
0.433	2.20	3.433	3.52	6.433	15.82	9.43	3.08
0.450	2.20	3.450	3.52	6.450	15.82	9.45	3.08
0.467	2.20	3.467	3.52	6.467	15.82	9.47	3.08
0.483	2.20	3.483	3.52	6.483	15.82	9.48	3.08
0.500	2.20	3.500	3.52	6.500	15.81	9.50	3.08
0.517	2.20	3.517	3.52	6.517	7.03	9.52	3.08
0.533	2.20	3.533	3.52	6.533	7.03	9.53	3.08
0.550	2.20	3.550	3.52	6.550	7.03	9.55	3.08
0.567	2.20	3.567	3.52	6.567	7.03	9.57	3.08
0.583	2.20	3.583	3.52	6.583	7.03	9.58	3.08
0.600	2.20	3.600	3.52	6.600	7.03	9.60	3.08
0.617	2.20	3.617	3.52	6.617	7.03	9.62	3.08
0.633	2.20	3.633	3.52	6.633	7.03	9.63	3.08
0.650	2.20	3.650	3.52	6.650	7.03	9.65	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.683	2.20	3.683	3.52	6.683	7.03	9.68	3.08
0.700	2.20	3.700	3.52	6.700	7.03	9.70	3.08
0.717	2.20	3.717	3.52	6.717	7.03	9.72	3.08
0.733	2.20	3.733	3.52	6.733	7.03	9.73	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.767	2.20	3.767	3.52	6.767	7.03	9.77	3.08
0.783	2.20	3.783	3.52	6.783	7.03	9.78	3.08
0.800	2.20	3.800	3.52	6.800	7.03	9.80	3.08
0.817	2.20	3.817	3.52	6.817	7.03	9.82	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.850	2.20	3.850	3.52	6.850	7.03	9.85	3.08
0.867	2.20	3.867	3.52	6.867	7.03	9.87	3.08
0.883	2.20	3.883	3.52	6.883	7.03	9.88	3.08
0.900	2.20	3.900	3.52	6.900	7.03	9.90	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
0.933	2.20	3.933	3.52	6.933	7.03	9.93	3.08
0.950	2.20	3.950	3.52	6.950	7.03	9.95	3.08
0.967	2.20	3.967	3.52	6.967	7.03	9.97	3.08
0.983	2.20	3.983	3.52	6.983	7.03	9.98	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.017	2.20	4.017	5.27	7.017	5.27	10.02	1.76
1.033	2.20	4.033	5.27	7.033	5.27	10.03	1.76
1.050	2.20	4.050	5.27	7.050	5.27	10.05	1.76
1.067	2.20	4.067	5.27	7.067	5.27	10.07	1.76
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.100	2.20	4.100	5.27	7.100	5.27	10.10	1.76
1.117	2.20	4.117	5.27	7.117	5.27	10.12	1.76
1.133	2.20	4.133	5.27	7.133	5.27	10.13	1.76
1.150	2.20	4.150	5.27	7.150	5.27	10.15	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.183	2.20	4.183	5.27	7.183	5.27	10.18	1.76
1.200	2.20	4.200	5.27	7.200	5.27	10.20	1.76
1.217	2.20	4.217	5.27	7.217	5.27	10.22	1.76
1.233	2.20	4.233	5.27	7.233	5.27	10.23	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.267	2.20	4.267	5.27	7.267	5.27	10.27	1.76
1.283	2.20	4.283	5.27	7.283	5.27	10.28	1.76
1.300	2.20	4.300	5.27	7.300	5.27	10.30	1.76

1.317	2.20	4.317	5.27	7.317	5.27	10.32	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.350	2.20	4.350	5.27	7.350	5.27	10.35	1.76
1.367	2.20	4.367	5.27	7.367	5.27	10.37	1.76
1.383	2.20	4.383	5.27	7.383	5.27	10.38	1.76
1.400	2.20	4.400	5.27	7.400	5.27	10.40	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.433	2.20	4.433	5.27	7.433	5.27	10.43	1.76
1.450	2.20	4.450	5.27	7.450	5.27	10.45	1.76
1.467	2.20	4.467	5.27	7.467	5.27	10.47	1.76
1.483	2.20	4.483	5.27	7.483	5.27	10.48	1.76
1.500	2.20	4.500	5.28	7.500	5.27	10.50	1.76
1.517	2.20	4.517	7.03	7.517	5.27	10.52	1.76
1.533	2.20	4.533	7.03	7.533	5.27	10.53	1.76
1.550	2.20	4.550	7.03	7.550	5.27	10.55	1.76
1.567	2.20	4.567	7.03	7.567	5.27	10.57	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.600	2.20	4.600	7.03	7.600	5.27	10.60	1.76
1.617	2.20	4.617	7.03	7.617	5.27	10.62	1.76
1.633	2.20	4.633	7.03	7.633	5.27	10.63	1.76
1.650	2.20	4.650	7.03	7.650	5.27	10.65	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.683	2.20	4.683	7.03	7.683	5.27	10.68	1.76
1.700	2.20	4.700	7.03	7.700	5.27	10.70	1.76
1.717	2.20	4.717	7.03	7.717	5.27	10.72	1.76
1.733	2.20	4.733	7.03	7.733	5.27	10.73	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.767	2.20	4.767	7.03	7.767	5.27	10.77	1.76
1.783	2.20	4.783	7.03	7.783	5.27	10.78	1.76
1.800	2.20	4.800	7.03	7.800	5.27	10.80	1.76
1.817	2.20	4.817	7.03	7.817	5.27	10.82	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.850	2.20	4.850	7.03	7.850	5.27	10.85	1.76
1.867	2.20	4.867	7.03	7.867	5.27	10.87	1.76
1.883	2.20	4.883	7.03	7.883	5.27	10.88	1.76
1.900	2.20	4.900	7.03	7.900	5.27	10.90	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
1.933	2.20	4.933	7.03	7.933	5.27	10.93	1.76
1.950	2.20	4.950	7.03	7.950	5.27	10.95	1.76
1.967	2.20	4.967	7.03	7.967	5.27	10.97	1.76
1.983	2.20	4.983	7.03	7.983	5.27	10.98	1.76
2.000	2.20	5.000	7.04	8.000	5.27	11.00	1.76
2.017	2.64	5.017	10.55	8.017	3.08	11.02	1.76
2.033	2.64	5.033	10.55	8.033	3.08	11.03	1.76
2.050	2.64	5.050	10.55	8.050	3.08	11.05	1.76
2.067	2.64	5.067	10.55	8.067	3.08	11.07	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.100	2.64	5.100	10.55	8.100	3.08	11.10	1.76
2.117	2.64	5.117	10.55	8.117	3.08	11.12	1.76
2.133	2.64	5.133	10.55	8.133	3.08	11.13	1.76
2.150	2.64	5.150	10.55	8.150	3.08	11.15	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.183	2.64	5.183	10.55	8.183	3.08	11.18	1.76
2.200	2.64	5.200	10.55	8.200	3.08	11.20	1.76
2.217	2.64	5.217	10.55	8.217	3.08	11.22	1.76
2.233	2.64	5.233	10.55	8.233	3.08	11.23	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.267	2.64	5.267	10.55	8.267	3.08	11.27	1.76
2.283	2.64	5.283	10.55	8.283	3.08	11.28	1.76
2.300	2.64	5.300	10.55	8.300	3.08	11.30	1.76
2.317	2.64	5.317	10.55	8.317	3.08	11.32	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.350	2.64	5.350	10.55	8.350	3.08	11.35	1.76
2.367	2.64	5.367	10.55	8.367	3.08	11.37	1.76
2.383	2.64	5.383	10.55	8.383	3.08	11.38	1.76
2.400	2.64	5.400	10.55	8.400	3.08	11.40	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.433	2.64	5.433	10.55	8.433	3.08	11.43	1.76
2.450	2.64	5.450	10.55	8.450	3.08	11.45	1.76
2.467	2.64	5.467	10.55	8.467	3.08	11.47	1.76
2.483	2.64	5.483	10.55	8.483	3.08	11.48	1.76
2.500	2.64	5.500	10.58	8.500	3.08	11.50	1.76
2.517	2.64	5.517	42.20	8.517	3.08	11.52	1.76
2.533	2.64	5.533	42.20	8.533	3.08	11.53	1.76
2.550	2.64	5.550	42.20	8.550	3.08	11.55	1.76
2.567	2.64	5.567	42.20	8.567	3.08	11.57	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.600	2.64	5.600	42.20	8.600	3.08	11.60	1.76
2.617	2.64	5.617	42.20	8.617	3.08	11.62	1.76

2.633	2.64	5.633	42.20	8.633	3.08	11.63	1.76
2.650	2.64	5.650	42.20	8.650	3.08	11.65	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.683	2.64	5.683	42.20	8.683	3.08	11.68	1.76
2.700	2.64	5.700	42.20	8.700	3.08	11.70	1.76
2.717	2.64	5.717	42.20	8.717	3.08	11.72	1.76
2.733	2.64	5.733	42.20	8.733	3.08	11.73	1.76
2.750	2.64	5.750	42.29	8.750	3.08	11.75	1.76
2.767	2.64	5.767	116.04	8.767	3.08	11.77	1.76
2.783	2.64	5.783	116.04	8.783	3.08	11.78	1.76
2.800	2.64	5.800	116.04	8.800	3.08	11.80	1.76
2.817	2.64	5.817	116.04	8.817	3.08	11.82	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.850	2.64	5.850	116.04	8.850	3.08	11.85	1.76
2.867	2.64	5.867	116.04	8.867	3.08	11.87	1.76
2.883	2.64	5.883	116.04	8.883	3.08	11.88	1.76
2.900	2.64	5.900	116.04	8.900	3.08	11.90	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
2.933	2.64	5.933	116.04	8.933	3.08	11.93	1.76
2.950	2.64	5.950	116.04	8.950	3.08	11.95	1.76
2.967	2.64	5.967	116.04	8.967	3.08	11.97	1.76
2.983	2.64	5.983	116.04	8.983	3.08	11.98	1.76
3.000	2.64	6.000	115.90	9.000	3.08	12.00	1.76

Max.Eff.Inten.(mm/hr)=		116.04	51.86	
over (min)		5.00	10.00	
Storage Coeff. (min)=		2.70 (ii)	9.11 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.32	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.32	0.09	0.399 (iii)
TIME TO PEAK	(hrs)=	6.00	6.07	6.00
RUNOFF VOLUME	(mm)=	91.91	23.80	52.20
TOTAL RAINFALL	(mm)=	87.91	87.91	87.91
RUNOFF COEFFICIENT	=	0.99	0.27	0.59

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)	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	0.0570	0.0442
	0.0008	0.0012	0.0640	0.0503
	0.0063	0.0138	0.0780	0.0611
	0.0090	0.0149	0.0830	0.0649
	0.0320	0.0249	0.0000	0.0000

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)		2.200	0.399	6.00	52.20
OUTFLOW: ID= 1 (0010)		2.200	0.076	6.40	52.03

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.99
TIME SHIFT OF PEAK FLOW (min)= 24.00
MAXIMUM STORAGE USED (ha.m.)= 0.0595

CALIB			
STANDHYD (0039)	Area (ha)=	0.08	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.04	0.04
Dep. Storage	(mm)=	1.00	2.30
Average Slope	(%)=	1.00	2.00
Length	(m)=	23.09	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.20	3.083	3.52	6.083	15.82	9.08	3.08
0.167	2.20	3.167	3.52	6.167	15.82	9.17	3.08
0.250	2.20	3.250	3.52	6.250	15.82	9.25	3.08
0.333	2.20	3.333	3.52	6.333	15.82	9.33	3.08
0.417	2.20	3.417	3.52	6.417	15.82	9.42	3.08
0.500	2.20	3.500	3.52	6.500	15.82	9.50	3.08
0.583	2.20	3.583	3.52	6.583	7.03	9.58	3.08
0.667	2.20	3.667	3.52	6.667	7.03	9.67	3.08
0.750	2.20	3.750	3.52	6.750	7.03	9.75	3.08
0.833	2.20	3.833	3.52	6.833	7.03	9.83	3.08
0.917	2.20	3.917	3.52	6.917	7.03	9.92	3.08
1.000	2.20	4.000	3.52	7.000	7.03	10.00	3.08
1.083	2.20	4.083	5.27	7.083	5.27	10.08	1.76
1.167	2.20	4.167	5.27	7.167	5.27	10.17	1.76
1.250	2.20	4.250	5.27	7.250	5.27	10.25	1.76
1.333	2.20	4.333	5.27	7.333	5.27	10.33	1.76
1.417	2.20	4.417	5.27	7.417	5.27	10.42	1.76
1.500	2.20	4.500	5.27	7.500	5.27	10.50	1.76
1.583	2.20	4.583	7.03	7.583	5.27	10.58	1.76
1.667	2.20	4.667	7.03	7.667	5.27	10.67	1.76
1.750	2.20	4.750	7.03	7.750	5.27	10.75	1.76
1.833	2.20	4.833	7.03	7.833	5.27	10.83	1.76
1.917	2.20	4.917	7.03	7.917	5.27	10.92	1.76
2.000	2.20	5.000	7.03	8.000	5.27	11.00	1.76
2.083	2.64	5.083	10.55	8.083	3.08	11.08	1.76
2.167	2.64	5.167	10.55	8.167	3.08	11.17	1.76
2.250	2.64	5.250	10.55	8.250	3.08	11.25	1.76
2.333	2.64	5.333	10.55	8.333	3.08	11.33	1.76
2.417	2.64	5.417	10.55	8.417	3.08	11.42	1.76
2.500	2.64	5.500	10.55	8.500	3.08	11.50	1.76
2.583	2.64	5.583	42.20	8.583	3.08	11.58	1.76
2.667	2.64	5.667	42.20	8.667	3.08	11.67	1.76
2.750	2.64	5.750	42.20	8.750	3.08	11.75	1.76
2.833	2.64	5.833	116.04	8.833	3.08	11.83	1.76
2.917	2.64	5.917	116.04	8.917	3.08	11.92	1.76
3.000	2.64	6.000	116.04	9.000	3.08	12.00	1.76

Max.Eff.Inten.(mm/hr)=	116.04	144.71	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.00 (ii)	7.09 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.14	
			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.023 (iii)
TIME TO PEAK (hrs)=	6.00	6.00	6.00
RUNOFF VOLUME (mm)=	86.91	75.25	79.26
TOTAL RAINFALL (mm)=	87.91	87.91	87.91
RUNOFF COEFFICIENT =	0.99	0.86	0.90

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 94.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	2.20	0.076	6.40	52.03
+ ID2= 2 (0011):	0.75	0.103	6.08	73.83
ID = 3 (0004):	2.95	0.173	6.12	57.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
        ID1= 3 (  0004):     2.95   0.173     6.12    57.57
      + ID2= 2 (  0027):    16.11   0.429     6.97    27.68
        ================================================
        ID = 1 (  0004):    19.06   0.531     6.83    32.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    19.06   0.531     6.83    32.31
      + ID2= 2 (  0003):     4.63   0.023    10.08    34.94
        ================================================
        ID = 3 (  0004):    23.69   0.553     6.83    32.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):    23.69   0.553     6.83    32.82
      + ID2= 2 (  0039):     0.08   0.023     6.00    79.26
        ================================================
        ID = 1 (  0004):    23.77   0.554     6.83    32.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    23.77   0.554     6.83    32.98
      + ID2= 2 (  0009):     2.02   0.384     6.00    51.92
        ================================================
        ID = 3 (  0004):    25.79   0.671     6.02    34.46

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
  ***********************************************
  ** SIMULATION : Run 12                       **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\pcallaghan\AppD
|                  |              ata\Local\Temp\
|                  |              d1c59b48-457d-442d-8825-8b87b5d6c641\9c9568e7
| Ptotal= 95.97 mm |    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    2.40 |  3.25    3.84 |  6.25   17.27 |  9.25    3.36
                0.50    2.40 |  3.50    3.84 |  6.50   17.27 |  9.50    3.36
                0.75    2.40 |  3.75    3.84 |  6.75    7.68 |  9.75    3.36
                1.00    2.40 |  4.00    3.84 |  7.00    7.68 | 10.00    3.36
                1.25    2.40 |  4.25    5.76 |  7.25    5.76 | 10.25    1.92
                1.50    2.40 |  4.50    5.76 |  7.50    5.76 | 10.50    1.92
                1.75    2.40 |  4.75    7.68 |  7.75    5.76 | 10.75    1.92
                2.00    2.40 |  5.00    7.68 |  8.00    5.76 | 11.00    1.92
                2.25    2.88 |  5.25   11.52 |  8.25    3.36 | 11.25    1.92
                2.50    2.88 |  5.50   11.52 |  8.50    3.36 | 11.50    1.92
                2.75    2.88 |  5.75   46.07 |  8.75    3.36 | 11.75    1.92
                3.00    2.88 |  6.00  126.68 |  9.00    3.36 | 12.00    1.92

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

--------------------
| CALIB            |
| NASHYD   (  0025)|   Area    (ha)=   1.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.34

         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	2.40	3.017	3.84	6.017	17.27	9.02	3.36
0.033	2.40	3.033	3.84	6.033	17.27	9.03	3.36
0.050	2.40	3.050	3.84	6.050	17.27	9.05	3.36
0.067	2.40	3.067	3.84	6.067	17.27	9.07	3.36
0.083	2.40	3.083	3.84	6.083	17.27	9.08	3.36
0.100	2.40	3.100	3.84	6.100	17.27	9.10	3.36
0.117	2.40	3.117	3.84	6.117	17.27	9.12	3.36
0.133	2.40	3.133	3.84	6.133	17.27	9.13	3.36
0.150	2.40	3.150	3.84	6.150	17.27	9.15	3.36
0.167	2.40	3.167	3.84	6.167	17.27	9.17	3.36
0.183	2.40	3.183	3.84	6.183	17.27	9.18	3.36
0.200	2.40	3.200	3.84	6.200	17.27	9.20	3.36
0.217	2.40	3.217	3.84	6.217	17.27	9.22	3.36
0.233	2.40	3.233	3.84	6.233	17.27	9.23	3.36
0.250	2.40	3.250	3.84	6.250	17.27	9.25	3.36
0.267	2.40	3.267	3.84	6.267	17.27	9.27	3.36
0.283	2.40	3.283	3.84	6.283	17.27	9.28	3.36
0.300	2.40	3.300	3.84	6.300	17.27	9.30	3.36
0.317	2.40	3.317	3.84	6.317	17.27	9.32	3.36
0.333	2.40	3.333	3.84	6.333	17.27	9.33	3.36
0.350	2.40	3.350	3.84	6.350	17.27	9.35	3.36
0.367	2.40	3.367	3.84	6.367	17.27	9.37	3.36
0.383	2.40	3.383	3.84	6.383	17.27	9.38	3.36
0.400	2.40	3.400	3.84	6.400	17.27	9.40	3.36
0.417	2.40	3.417	3.84	6.417	17.27	9.42	3.36
0.433	2.40	3.433	3.84	6.433	17.27	9.43	3.36
0.450	2.40	3.450	3.84	6.450	17.27	9.45	3.36
0.467	2.40	3.467	3.84	6.467	17.27	9.47	3.36
0.483	2.40	3.483	3.84	6.483	17.27	9.48	3.36
0.500	2.40	3.500	3.84	6.500	17.26	9.50	3.36
0.517	2.40	3.517	3.84	6.517	7.68	9.52	3.36
0.533	2.40	3.533	3.84	6.533	7.68	9.53	3.36
0.550	2.40	3.550	3.84	6.550	7.68	9.55	3.36
0.567	2.40	3.567	3.84	6.567	7.68	9.57	3.36
0.583	2.40	3.583	3.84	6.583	7.68	9.58	3.36
0.600	2.40	3.600	3.84	6.600	7.68	9.60	3.36
0.617	2.40	3.617	3.84	6.617	7.68	9.62	3.36
0.633	2.40	3.633	3.84	6.633	7.68	9.63	3.36
0.650	2.40	3.650	3.84	6.650	7.68	9.65	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.683	2.40	3.683	3.84	6.683	7.68	9.68	3.36
0.700	2.40	3.700	3.84	6.700	7.68	9.70	3.36
0.717	2.40	3.717	3.84	6.717	7.68	9.72	3.36
0.733	2.40	3.733	3.84	6.733	7.68	9.73	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.767	2.40	3.767	3.84	6.767	7.68	9.77	3.36
0.783	2.40	3.783	3.84	6.783	7.68	9.78	3.36
0.800	2.40	3.800	3.84	6.800	7.68	9.80	3.36
0.817	2.40	3.817	3.84	6.817	7.68	9.82	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.850	2.40	3.850	3.84	6.850	7.68	9.85	3.36
0.867	2.40	3.867	3.84	6.867	7.68	9.87	3.36
0.883	2.40	3.883	3.84	6.883	7.68	9.88	3.36
0.900	2.40	3.900	3.84	6.900	7.68	9.90	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
0.933	2.40	3.933	3.84	6.933	7.68	9.93	3.36
0.950	2.40	3.950	3.84	6.950	7.68	9.95	3.36
0.967	2.40	3.967	3.84	6.967	7.68	9.97	3.36
0.983	2.40	3.983	3.84	6.983	7.68	9.98	3.36
1.000	2.40	4.000	3.84	7.000	7.67	10.00	3.36
1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92
1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92

1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92
1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92
2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92
2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92
2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92

2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92
2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.112 (i)
TIME TO PEAK (hrs)= 6.233
RUNOFF VOLUME (mm)= 38.298
TOTAL RAINFALL (mm)= 95.968
RUNOFF COEFFICIENT = 0.399

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

CALIB	
STANDHYD (0001)	Area (ha)= 2.91
ID= 1 DT= 1.0 min	Total Imp(%)= 56.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.63	1.28
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.50	3.00
Length	(m)=	139.28	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	2.40	3.017	3.84	6.017	17.27	9.02	3.36
0.033	2.40	3.033	3.84	6.033	17.27	9.03	3.36
0.050	2.40	3.050	3.84	6.050	17.27	9.05	3.36
0.067	2.40	3.067	3.84	6.067	17.27	9.07	3.36
0.083	2.40	3.083	3.84	6.083	17.27	9.08	3.36
0.100	2.40	3.100	3.84	6.100	17.27	9.10	3.36
0.117	2.40	3.117	3.84	6.117	17.27	9.12	3.36
0.133	2.40	3.133	3.84	6.133	17.27	9.13	3.36
0.150	2.40	3.150	3.84	6.150	17.27	9.15	3.36
0.167	2.40	3.167	3.84	6.167	17.27	9.17	3.36
0.183	2.40	3.183	3.84	6.183	17.27	9.18	3.36
0.200	2.40	3.200	3.84	6.200	17.27	9.20	3.36
0.217	2.40	3.217	3.84	6.217	17.27	9.22	3.36
0.233	2.40	3.233	3.84	6.233	17.27	9.23	3.36
0.250	2.40	3.250	3.84	6.250	17.27	9.25	3.36
0.267	2.40	3.267	3.84	6.267	17.27	9.27	3.36
0.283	2.40	3.283	3.84	6.283	17.27	9.28	3.36
0.300	2.40	3.300	3.84	6.300	17.27	9.30	3.36
0.317	2.40	3.317	3.84	6.317	17.27	9.32	3.36
0.333	2.40	3.333	3.84	6.333	17.27	9.33	3.36
0.350	2.40	3.350	3.84	6.350	17.27	9.35	3.36
0.367	2.40	3.367	3.84	6.367	17.27	9.37	3.36
0.383	2.40	3.383	3.84	6.383	17.27	9.38	3.36

0.400	2.40	3.400	3.84	6.400	17.27	9.40	3.36
0.417	2.40	3.417	3.84	6.417	17.27	9.42	3.36
0.433	2.40	3.433	3.84	6.433	17.27	9.43	3.36
0.450	2.40	3.450	3.84	6.450	17.27	9.45	3.36
0.467	2.40	3.467	3.84	6.467	17.27	9.47	3.36
0.483	2.40	3.483	3.84	6.483	17.27	9.48	3.36
0.500	2.40	3.500	3.84	6.500	17.26	9.50	3.36
0.517	2.40	3.517	3.84	6.517	7.68	9.52	3.36
0.533	2.40	3.533	3.84	6.533	7.68	9.53	3.36
0.550	2.40	3.550	3.84	6.550	7.68	9.55	3.36
0.567	2.40	3.567	3.84	6.567	7.68	9.57	3.36
0.583	2.40	3.583	3.84	6.583	7.68	9.58	3.36
0.600	2.40	3.600	3.84	6.600	7.68	9.60	3.36
0.617	2.40	3.617	3.84	6.617	7.68	9.62	3.36
0.633	2.40	3.633	3.84	6.633	7.68	9.63	3.36
0.650	2.40	3.650	3.84	6.650	7.68	9.65	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.683	2.40	3.683	3.84	6.683	7.68	9.68	3.36
0.700	2.40	3.700	3.84	6.700	7.68	9.70	3.36
0.717	2.40	3.717	3.84	6.717	7.68	9.72	3.36
0.733	2.40	3.733	3.84	6.733	7.68	9.73	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.767	2.40	3.767	3.84	6.767	7.68	9.77	3.36
0.783	2.40	3.783	3.84	6.783	7.68	9.78	3.36
0.800	2.40	3.800	3.84	6.800	7.68	9.80	3.36
0.817	2.40	3.817	3.84	6.817	7.68	9.82	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.850	2.40	3.850	3.84	6.850	7.68	9.85	3.36
0.867	2.40	3.867	3.84	6.867	7.68	9.87	3.36
0.883	2.40	3.883	3.84	6.883	7.68	9.88	3.36
0.900	2.40	3.900	3.84	6.900	7.68	9.90	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
0.933	2.40	3.933	3.84	6.933	7.68	9.93	3.36
0.950	2.40	3.950	3.84	6.950	7.68	9.95	3.36
0.967	2.40	3.967	3.84	6.967	7.68	9.97	3.36
0.983	2.40	3.983	3.84	6.983	7.68	9.98	3.36
1.000	2.40	4.000	3.84	7.000	7.67	10.00	3.36
1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92
1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92

1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92
2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92
2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92
2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92
2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Max.Eff.Inten.(mm/hr)=	126.68	43.43	
over (min)	5.00	8.00	
Storage Coeff. (min)=	2.51 (ii)	7.87 (ii)	
Unit Hyd. Tpeak (min)=	5.00	8.00	
Unit Hyd. peak (cms)=	0.34	0.14	
			TOTALS
PEAK FLOW (cms)=	0.52	0.12	0.631 (iii)
TIME TO PEAK (hrs)=	6.00	6.05	6.00
RUNOFF VOLUME (mm)=	94.97	24.00	60.19
TOTAL RAINFALL (mm)=	95.97	95.97	95.97
RUNOFF COEFFICIENT =	0.99	0.25	0.63

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0028)	Area (ha)=	0.29	
ID= 1 DT= 1.0 min	Total Imp(%)=	67.00	Dir. Conn.(%)= 67.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.19	0.10
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	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	2.40	3.017	3.84	6.017	17.27	9.02	3.36
0.033	2.40	3.033	3.84	6.033	17.27	9.03	3.36
0.050	2.40	3.050	3.84	6.050	17.27	9.05	3.36
0.067	2.40	3.067	3.84	6.067	17.27	9.07	3.36
0.083	2.40	3.083	3.84	6.083	17.27	9.08	3.36
0.100	2.40	3.100	3.84	6.100	17.27	9.10	3.36
0.117	2.40	3.117	3.84	6.117	17.27	9.12	3.36
0.133	2.40	3.133	3.84	6.133	17.27	9.13	3.36
0.150	2.40	3.150	3.84	6.150	17.27	9.15	3.36
0.167	2.40	3.167	3.84	6.167	17.27	9.17	3.36
0.183	2.40	3.183	3.84	6.183	17.27	9.18	3.36
0.200	2.40	3.200	3.84	6.200	17.27	9.20	3.36
0.217	2.40	3.217	3.84	6.217	17.27	9.22	3.36
0.233	2.40	3.233	3.84	6.233	17.27	9.23	3.36
0.250	2.40	3.250	3.84	6.250	17.27	9.25	3.36
0.267	2.40	3.267	3.84	6.267	17.27	9.27	3.36
0.283	2.40	3.283	3.84	6.283	17.27	9.28	3.36
0.300	2.40	3.300	3.84	6.300	17.27	9.30	3.36
0.317	2.40	3.317	3.84	6.317	17.27	9.32	3.36
0.333	2.40	3.333	3.84	6.333	17.27	9.33	3.36
0.350	2.40	3.350	3.84	6.350	17.27	9.35	3.36
0.367	2.40	3.367	3.84	6.367	17.27	9.37	3.36
0.383	2.40	3.383	3.84	6.383	17.27	9.38	3.36
0.400	2.40	3.400	3.84	6.400	17.27	9.40	3.36
0.417	2.40	3.417	3.84	6.417	17.27	9.42	3.36
0.433	2.40	3.433	3.84	6.433	17.27	9.43	3.36
0.450	2.40	3.450	3.84	6.450	17.27	9.45	3.36
0.467	2.40	3.467	3.84	6.467	17.27	9.47	3.36
0.483	2.40	3.483	3.84	6.483	17.27	9.48	3.36
0.500	2.40	3.500	3.84	6.500	17.26	9.50	3.36
0.517	2.40	3.517	3.84	6.517	7.68	9.52	3.36
0.533	2.40	3.533	3.84	6.533	7.68	9.53	3.36
0.550	2.40	3.550	3.84	6.550	7.68	9.55	3.36
0.567	2.40	3.567	3.84	6.567	7.68	9.57	3.36
0.583	2.40	3.583	3.84	6.583	7.68	9.58	3.36
0.600	2.40	3.600	3.84	6.600	7.68	9.60	3.36
0.617	2.40	3.617	3.84	6.617	7.68	9.62	3.36
0.633	2.40	3.633	3.84	6.633	7.68	9.63	3.36
0.650	2.40	3.650	3.84	6.650	7.68	9.65	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.683	2.40	3.683	3.84	6.683	7.68	9.68	3.36

0.700	2.40	3.700	3.84	6.700	7.68	9.70	3.36
0.717	2.40	3.717	3.84	6.717	7.68	9.72	3.36
0.733	2.40	3.733	3.84	6.733	7.68	9.73	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.767	2.40	3.767	3.84	6.767	7.68	9.77	3.36
0.783	2.40	3.783	3.84	6.783	7.68	9.78	3.36
0.800	2.40	3.800	3.84	6.800	7.68	9.80	3.36
0.817	2.40	3.817	3.84	6.817	7.68	9.82	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.850	2.40	3.850	3.84	6.850	7.68	9.85	3.36
0.867	2.40	3.867	3.84	6.867	7.68	9.87	3.36
0.883	2.40	3.883	3.84	6.883	7.68	9.88	3.36
0.900	2.40	3.900	3.84	6.900	7.68	9.90	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
0.933	2.40	3.933	3.84	6.933	7.68	9.93	3.36
0.950	2.40	3.950	3.84	6.950	7.68	9.95	3.36
0.967	2.40	3.967	3.84	6.967	7.68	9.97	3.36
0.983	2.40	3.983	3.84	6.983	7.68	9.98	3.36
1.000	2.40	4.000	3.84	7.000	7.67	10.00	3.36
1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92
1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92
1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92

2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92
2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92
2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92
2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Max.Eff.Inten.(mm/hr)=	126.68	35.64	
over (min)	5.00	7.00	
Storage Coeff. (min)=	1.42 (ii)	6.26 (ii)	
Unit Hyd. Tpeak (min)=	5.00	7.00	
Unit Hyd. peak (cms)=	0.43	0.17	
			TOTALS
PEAK FLOW (cms)=	0.07	0.01	0.076 (iii)
TIME TO PEAK (hrs)=	6.00	6.03	6.00
RUNOFF VOLUME (mm)=	94.97	21.93	70.85
TOTAL RAINFALL (mm)=	95.97	95.97	95.97
RUNOFF COEFFICIENT =	0.99	0.23	0.74

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.91   0.631     6.00    60.19
      + ID2= 2 (  0025):     1.43   0.112     6.23    38.30
        ====================================================
        ID = 3 (  0016):     4.34   0.698     6.00    52.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0016):     4.34   0.698     6.00    52.98
      + ID2= 2 (  0028):     0.29   0.076     6.00    70.85
        ================================================
        ID = 1 (  0016):     4.63   0.774     6.00    54.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0003)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.0130      0.0895
                          0.0000     0.0291    |   0.0210      0.1555
                          0.0010     0.0332    |   0.0230      0.1780
                          0.0040     0.0496    |   0.0280      0.2176
                          0.0050     0.0537    |   0.0300      0.2309

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0016)      4.630      0.774      6.00      54.10
   OUTFLOW: ID= 1 (  0003)      4.630      0.026     10.08      39.20

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.32
                  TIME SHIFT OF PEAK FLOW         (min)=245.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1993

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0026)|   Area    (ha)=   0.27   Curve Number   (CN)= 71.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   3.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.02

         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    2.40 | 3.017    3.84 | 6.017   17.27 |  9.02    3.36
              0.033    2.40 | 3.033    3.84 | 6.033   17.27 |  9.03    3.36
              0.050    2.40 | 3.050    3.84 | 6.050   17.27 |  9.05    3.36
              0.067    2.40 | 3.067    3.84 | 6.067   17.27 |  9.07    3.36
              0.083    2.40 | 3.083    3.84 | 6.083   17.27 |  9.08    3.36
              0.100    2.40 | 3.100    3.84 | 6.100   17.27 |  9.10    3.36
              0.117    2.40 | 3.117    3.84 | 6.117   17.27 |  9.12    3.36
              0.133    2.40 | 3.133    3.84 | 6.133   17.27 |  9.13    3.36
              0.150    2.40 | 3.150    3.84 | 6.150   17.27 |  9.15    3.36
              0.167    2.40 | 3.167    3.84 | 6.167   17.27 |  9.17    3.36
              0.183    2.40 | 3.183    3.84 | 6.183   17.27 |  9.18    3.36
              0.200    2.40 | 3.200    3.84 | 6.200   17.27 |  9.20    3.36
              0.217    2.40 | 3.217    3.84 | 6.217   17.27 |  9.22    3.36
              0.233    2.40 | 3.233    3.84 | 6.233   17.27 |  9.23    3.36
              0.250    2.40 | 3.250    3.84 | 6.250   17.27 |  9.25    3.36
              0.267    2.40 | 3.267    3.84 | 6.267   17.27 |  9.27    3.36
              0.283    2.40 | 3.283    3.84 | 6.283   17.27 |  9.28    3.36
              0.300    2.40 | 3.300    3.84 | 6.300   17.27 |  9.30    3.36
              0.317    2.40 | 3.317    3.84 | 6.317   17.27 |  9.32    3.36
              0.333    2.40 | 3.333    3.84 | 6.333   17.27 |  9.33    3.36
```

0.350	2.40	3.350	3.84	6.350	17.27	9.35	3.36
0.367	2.40	3.367	3.84	6.367	17.27	9.37	3.36
0.383	2.40	3.383	3.84	6.383	17.27	9.38	3.36
0.400	2.40	3.400	3.84	6.400	17.27	9.40	3.36
0.417	2.40	3.417	3.84	6.417	17.27	9.42	3.36
0.433	2.40	3.433	3.84	6.433	17.27	9.43	3.36
0.450	2.40	3.450	3.84	6.450	17.27	9.45	3.36
0.467	2.40	3.467	3.84	6.467	17.27	9.47	3.36
0.483	2.40	3.483	3.84	6.483	17.27	9.48	3.36
0.500	2.40	3.500	3.84	6.500	17.26	9.50	3.36
0.517	2.40	3.517	3.84	6.517	7.68	9.52	3.36
0.533	2.40	3.533	3.84	6.533	7.68	9.53	3.36
0.550	2.40	3.550	3.84	6.550	7.68	9.55	3.36
0.567	2.40	3.567	3.84	6.567	7.68	9.57	3.36
0.583	2.40	3.583	3.84	6.583	7.68	9.58	3.36
0.600	2.40	3.600	3.84	6.600	7.68	9.60	3.36
0.617	2.40	3.617	3.84	6.617	7.68	9.62	3.36
0.633	2.40	3.633	3.84	6.633	7.68	9.63	3.36
0.650	2.40	3.650	3.84	6.650	7.68	9.65	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.683	2.40	3.683	3.84	6.683	7.68	9.68	3.36
0.700	2.40	3.700	3.84	6.700	7.68	9.70	3.36
0.717	2.40	3.717	3.84	6.717	7.68	9.72	3.36
0.733	2.40	3.733	3.84	6.733	7.68	9.73	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.767	2.40	3.767	3.84	6.767	7.68	9.77	3.36
0.783	2.40	3.783	3.84	6.783	7.68	9.78	3.36
0.800	2.40	3.800	3.84	6.800	7.68	9.80	3.36
0.817	2.40	3.817	3.84	6.817	7.68	9.82	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.850	2.40	3.850	3.84	6.850	7.68	9.85	3.36
0.867	2.40	3.867	3.84	6.867	7.68	9.87	3.36
0.883	2.40	3.883	3.84	6.883	7.68	9.88	3.36
0.900	2.40	3.900	3.84	6.900	7.68	9.90	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
0.933	2.40	3.933	3.84	6.933	7.68	9.93	3.36
0.950	2.40	3.950	3.84	6.950	7.68	9.95	3.36
0.967	2.40	3.967	3.84	6.967	7.68	9.97	3.36
0.983	2.40	3.983	3.84	6.983	7.68	9.98	3.36
1.000	2.40	4.000	3.84	7.000	7.67	10.00	3.36
1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92
1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92

1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92
1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92
2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92
2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92
2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92

2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Unit Hyd Qpeak (cms)= 0.516

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 42.795
TOTAL RAINFALL (mm)= 95.968
RUNOFF COEFFICIENT = 0.446

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

CALIB
STANDHYD (0007)
ID= 1 DT= 1.0 min

Area (ha)= 1.75
Total Imp(%)= 58.00 Dir. Conn.(%)= 51.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.01	0.74
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	108.01	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	2.40	3.017	3.84	6.017	17.27	9.02	3.36
0.033	2.40	3.033	3.84	6.033	17.27	9.03	3.36
0.050	2.40	3.050	3.84	6.050	17.27	9.05	3.36
0.067	2.40	3.067	3.84	6.067	17.27	9.07	3.36
0.083	2.40	3.083	3.84	6.083	17.27	9.08	3.36
0.100	2.40	3.100	3.84	6.100	17.27	9.10	3.36
0.117	2.40	3.117	3.84	6.117	17.27	9.12	3.36
0.133	2.40	3.133	3.84	6.133	17.27	9.13	3.36
0.150	2.40	3.150	3.84	6.150	17.27	9.15	3.36
0.167	2.40	3.167	3.84	6.167	17.27	9.17	3.36
0.183	2.40	3.183	3.84	6.183	17.27	9.18	3.36
0.200	2.40	3.200	3.84	6.200	17.27	9.20	3.36
0.217	2.40	3.217	3.84	6.217	17.27	9.22	3.36
0.233	2.40	3.233	3.84	6.233	17.27	9.23	3.36
0.250	2.40	3.250	3.84	6.250	17.27	9.25	3.36
0.267	2.40	3.267	3.84	6.267	17.27	9.27	3.36
0.283	2.40	3.283	3.84	6.283	17.27	9.28	3.36
0.300	2.40	3.300	3.84	6.300	17.27	9.30	3.36
0.317	2.40	3.317	3.84	6.317	17.27	9.32	3.36
0.333	2.40	3.333	3.84	6.333	17.27	9.33	3.36
0.350	2.40	3.350	3.84	6.350	17.27	9.35	3.36
0.367	2.40	3.367	3.84	6.367	17.27	9.37	3.36
0.383	2.40	3.383	3.84	6.383	17.27	9.38	3.36
0.400	2.40	3.400	3.84	6.400	17.27	9.40	3.36
0.417	2.40	3.417	3.84	6.417	17.27	9.42	3.36
0.433	2.40	3.433	3.84	6.433	17.27	9.43	3.36
0.450	2.40	3.450	3.84	6.450	17.27	9.45	3.36
0.467	2.40	3.467	3.84	6.467	17.27	9.47	3.36
0.483	2.40	3.483	3.84	6.483	17.27	9.48	3.36
0.500	2.40	3.500	3.84	6.500	17.26	9.50	3.36
0.517	2.40	3.517	3.84	6.517	7.68	9.52	3.36
0.533	2.40	3.533	3.84	6.533	7.68	9.53	3.36
0.550	2.40	3.550	3.84	6.550	7.68	9.55	3.36
0.567	2.40	3.567	3.84	6.567	7.68	9.57	3.36
0.583	2.40	3.583	3.84	6.583	7.68	9.58	3.36
0.600	2.40	3.600	3.84	6.600	7.68	9.60	3.36
0.617	2.40	3.617	3.84	6.617	7.68	9.62	3.36
0.633	2.40	3.633	3.84	6.633	7.68	9.63	3.36
0.650	2.40	3.650	3.84	6.650	7.68	9.65	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.683	2.40	3.683	3.84	6.683	7.68	9.68	3.36
0.700	2.40	3.700	3.84	6.700	7.68	9.70	3.36
0.717	2.40	3.717	3.84	6.717	7.68	9.72	3.36
0.733	2.40	3.733	3.84	6.733	7.68	9.73	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.767	2.40	3.767	3.84	6.767	7.68	9.77	3.36
0.783	2.40	3.783	3.84	6.783	7.68	9.78	3.36

0.800	2.40	3.800	3.84	6.800	7.68	9.80	3.36
0.817	2.40	3.817	3.84	6.817	7.68	9.82	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.850	2.40	3.850	3.84	6.850	7.68	9.85	3.36
0.867	2.40	3.867	3.84	6.867	7.68	9.87	3.36
0.883	2.40	3.883	3.84	6.883	7.68	9.88	3.36
0.900	2.40	3.900	3.84	6.900	7.68	9.90	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
0.933	2.40	3.933	3.84	6.933	7.68	9.93	3.36
0.950	2.40	3.950	3.84	6.950	7.68	9.95	3.36
0.967	2.40	3.967	3.84	6.967	7.68	9.97	3.36
0.983	2.40	3.983	3.84	6.983	7.68	9.98	3.36
1.000	2.40	4.000	3.84	7.000	7.67	10.00	3.36
1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92
1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92
1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92
2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92

2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92
2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92
2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Max.Eff.Inten.(mm/hr)=	126.68	47.24	
over (min)	5.00	9.00	
Storage Coeff. (min)=	2.43 (ii)	8.38 (ii)	
Unit Hyd. Tpeak (min)=	5.00	9.00	
Unit Hyd. peak (cms)=	0.34	0.13	
			TOTALS
PEAK FLOW (cms)=	0.31	0.07	0.378 (iii)
TIME TO PEAK (hrs)=	6.00	6.07	6.00
RUNOFF VOLUME (mm)=	94.97	24.93	60.65
TOTAL RAINFALL (mm)=	95.97	95.97	95.97
RUNOFF COEFFICIENT =	0.99	0.26	0.63

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0018)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.

```
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0026):     0.27   0.056     6.00    42.80
      + ID2= 2 (  0007):     1.75   0.378     6.00    60.65
        ================================================
        ID = 3 (  0018):     2.02   0.434     6.00    58.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0009)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0007    |   0.0212      0.0291
                          0.0037     0.0045    |   0.0402      0.0316
                          0.0053     0.0065    |   0.1203      0.0341
                          0.0081     0.0128    |   0.2476      0.0366
                          0.0101     0.0188    |   0.3901      0.0373
                          0.0118     0.0250    |   0.4841      0.0381
                          0.0126     0.0279    |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0018)      2.020     0.434      6.00      58.26
   OUTFLOW: ID= 1 (  0009)      2.020     0.425      6.00      57.78

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 97.86
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0376

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0027)|   Area    (ha)=  16.11   Curve Number   (CN)= 61.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.95

         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    2.40 | 3.017    3.84 | 6.017   17.27 |  9.02    3.36
               0.033    2.40 | 3.033    3.84 | 6.033   17.27 |  9.03    3.36
               0.050    2.40 | 3.050    3.84 | 6.050   17.27 |  9.05    3.36
               0.067    2.40 | 3.067    3.84 | 6.067   17.27 |  9.07    3.36
               0.083    2.40 | 3.083    3.84 | 6.083   17.27 |  9.08    3.36
               0.100    2.40 | 3.100    3.84 | 6.100   17.27 |  9.10    3.36
               0.117    2.40 | 3.117    3.84 | 6.117   17.27 |  9.12    3.36
               0.133    2.40 | 3.133    3.84 | 6.133   17.27 |  9.13    3.36
               0.150    2.40 | 3.150    3.84 | 6.150   17.27 |  9.15    3.36
               0.167    2.40 | 3.167    3.84 | 6.167   17.27 |  9.17    3.36
               0.183    2.40 | 3.183    3.84 | 6.183   17.27 |  9.18    3.36
               0.200    2.40 | 3.200    3.84 | 6.200   17.27 |  9.20    3.36
               0.217    2.40 | 3.217    3.84 | 6.217   17.27 |  9.22    3.36
               0.233    2.40 | 3.233    3.84 | 6.233   17.27 |  9.23    3.36
               0.250    2.40 | 3.250    3.84 | 6.250   17.27 |  9.25    3.36
               0.267    2.40 | 3.267    3.84 | 6.267   17.27 |  9.27    3.36
               0.283    2.40 | 3.283    3.84 | 6.283   17.27 |  9.28    3.36
               0.300    2.40 | 3.300    3.84 | 6.300   17.27 |  9.30    3.36
               0.317    2.40 | 3.317    3.84 | 6.317   17.27 |  9.32    3.36
               0.333    2.40 | 3.333    3.84 | 6.333   17.27 |  9.33    3.36
               0.350    2.40 | 3.350    3.84 | 6.350   17.27 |  9.35    3.36
               0.367    2.40 | 3.367    3.84 | 6.367   17.27 |  9.37    3.36
               0.383    2.40 | 3.383    3.84 | 6.383   17.27 |  9.38    3.36
               0.400    2.40 | 3.400    3.84 | 6.400   17.27 |  9.40    3.36
               0.417    2.40 | 3.417    3.84 | 6.417   17.27 |  9.42    3.36
               0.433    2.40 | 3.433    3.84 | 6.433   17.27 |  9.43    3.36
               0.450    2.40 | 3.450    3.84 | 6.450   17.27 |  9.45    3.36
               0.467    2.40 | 3.467    3.84 | 6.467   17.27 |  9.47    3.36
               0.483    2.40 | 3.483    3.84 | 6.483   17.27 |  9.48    3.36
               0.500    2.40 | 3.500    3.84 | 6.500   17.26 |  9.50    3.36
               0.517    2.40 | 3.517    3.84 | 6.517    7.68 |  9.52    3.36
               0.533    2.40 | 3.533    3.84 | 6.533    7.68 |  9.53    3.36
               0.550    2.40 | 3.550    3.84 | 6.550    7.68 |  9.55    3.36
               0.567    2.40 | 3.567    3.84 | 6.567    7.68 |  9.57    3.36
               0.583    2.40 | 3.583    3.84 | 6.583    7.68 |  9.58    3.36
               0.600    2.40 | 3.600    3.84 | 6.600    7.68 |  9.60    3.36
```

0.617	2.40	3.617	3.84	6.617	7.68	9.62	3.36
0.633	2.40	3.633	3.84	6.633	7.68	9.63	3.36
0.650	2.40	3.650	3.84	6.650	7.68	9.65	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.683	2.40	3.683	3.84	6.683	7.68	9.68	3.36
0.700	2.40	3.700	3.84	6.700	7.68	9.70	3.36
0.717	2.40	3.717	3.84	6.717	7.68	9.72	3.36
0.733	2.40	3.733	3.84	6.733	7.68	9.73	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.767	2.40	3.767	3.84	6.767	7.68	9.77	3.36
0.783	2.40	3.783	3.84	6.783	7.68	9.78	3.36
0.800	2.40	3.800	3.84	6.800	7.68	9.80	3.36
0.817	2.40	3.817	3.84	6.817	7.68	9.82	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.850	2.40	3.850	3.84	6.850	7.68	9.85	3.36
0.867	2.40	3.867	3.84	6.867	7.68	9.87	3.36
0.883	2.40	3.883	3.84	6.883	7.68	9.88	3.36
0.900	2.40	3.900	3.84	6.900	7.68	9.90	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
0.933	2.40	3.933	3.84	6.933	7.68	9.93	3.36
0.950	2.40	3.950	3.84	6.950	7.68	9.95	3.36
0.967	2.40	3.967	3.84	6.967	7.68	9.97	3.36
0.983	2.40	3.983	3.84	6.983	7.68	9.98	3.36
1.000	2.40	4.000	3.84	7.000	7.67	10.00	3.36
1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92
1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92
1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92

1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92
2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92
2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92
2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92
2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Unit Hyd Qpeak (cms)= 0.648

PEAK FLOW (cms)= 0.502 (i)
TIME TO PEAK (hrs)= 6.967
RUNOFF VOLUME (mm)= 32.307
TOTAL RAINFALL (mm)= 95.968
RUNOFF COEFFICIENT = 0.337

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

CALIB

| STANDHYD (0006)| Area (ha)= 0.75
|ID= 1 DT= 1.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.68	0.08
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	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	2.40	3.017	3.84	6.017	17.27	9.02	3.36
0.033	2.40	3.033	3.84	6.033	17.27	9.03	3.36
0.050	2.40	3.050	3.84	6.050	17.27	9.05	3.36
0.067	2.40	3.067	3.84	6.067	17.27	9.07	3.36
0.083	2.40	3.083	3.84	6.083	17.27	9.08	3.36
0.100	2.40	3.100	3.84	6.100	17.27	9.10	3.36
0.117	2.40	3.117	3.84	6.117	17.27	9.12	3.36
0.133	2.40	3.133	3.84	6.133	17.27	9.13	3.36
0.150	2.40	3.150	3.84	6.150	17.27	9.15	3.36
0.167	2.40	3.167	3.84	6.167	17.27	9.17	3.36
0.183	2.40	3.183	3.84	6.183	17.27	9.18	3.36
0.200	2.40	3.200	3.84	6.200	17.27	9.20	3.36
0.217	2.40	3.217	3.84	6.217	17.27	9.22	3.36
0.233	2.40	3.233	3.84	6.233	17.27	9.23	3.36
0.250	2.40	3.250	3.84	6.250	17.27	9.25	3.36
0.267	2.40	3.267	3.84	6.267	17.27	9.27	3.36
0.283	2.40	3.283	3.84	6.283	17.27	9.28	3.36
0.300	2.40	3.300	3.84	6.300	17.27	9.30	3.36
0.317	2.40	3.317	3.84	6.317	17.27	9.32	3.36
0.333	2.40	3.333	3.84	6.333	17.27	9.33	3.36
0.350	2.40	3.350	3.84	6.350	17.27	9.35	3.36
0.367	2.40	3.367	3.84	6.367	17.27	9.37	3.36
0.383	2.40	3.383	3.84	6.383	17.27	9.38	3.36
0.400	2.40	3.400	3.84	6.400	17.27	9.40	3.36
0.417	2.40	3.417	3.84	6.417	17.27	9.42	3.36
0.433	2.40	3.433	3.84	6.433	17.27	9.43	3.36
0.450	2.40	3.450	3.84	6.450	17.27	9.45	3.36
0.467	2.40	3.467	3.84	6.467	17.27	9.47	3.36
0.483	2.40	3.483	3.84	6.483	17.27	9.48	3.36
0.500	2.40	3.500	3.84	6.500	17.26	9.50	3.36
0.517	2.40	3.517	3.84	6.517	7.68	9.52	3.36
0.533	2.40	3.533	3.84	6.533	7.68	9.53	3.36
0.550	2.40	3.550	3.84	6.550	7.68	9.55	3.36
0.567	2.40	3.567	3.84	6.567	7.68	9.57	3.36
0.583	2.40	3.583	3.84	6.583	7.68	9.58	3.36
0.600	2.40	3.600	3.84	6.600	7.68	9.60	3.36
0.617	2.40	3.617	3.84	6.617	7.68	9.62	3.36
0.633	2.40	3.633	3.84	6.633	7.68	9.63	3.36
0.650	2.40	3.650	3.84	6.650	7.68	9.65	3.36
0.667	2.40	3.667	3.84	6.667	7.68	9.67	3.36
0.683	2.40	3.683	3.84	6.683	7.68	9.68	3.36
0.700	2.40	3.700	3.84	6.700	7.68	9.70	3.36
0.717	2.40	3.717	3.84	6.717	7.68	9.72	3.36
0.733	2.40	3.733	3.84	6.733	7.68	9.73	3.36
0.750	2.40	3.750	3.84	6.750	7.68	9.75	3.36
0.767	2.40	3.767	3.84	6.767	7.68	9.77	3.36
0.783	2.40	3.783	3.84	6.783	7.68	9.78	3.36
0.800	2.40	3.800	3.84	6.800	7.68	9.80	3.36
0.817	2.40	3.817	3.84	6.817	7.68	9.82	3.36
0.833	2.40	3.833	3.84	6.833	7.68	9.83	3.36
0.850	2.40	3.850	3.84	6.850	7.68	9.85	3.36
0.867	2.40	3.867	3.84	6.867	7.68	9.87	3.36
0.883	2.40	3.883	3.84	6.883	7.68	9.88	3.36
0.900	2.40	3.900	3.84	6.900	7.68	9.90	3.36
0.917	2.40	3.917	3.84	6.917	7.68	9.92	3.36
0.933	2.40	3.933	3.84	6.933	7.68	9.93	3.36
0.950	2.40	3.950	3.84	6.950	7.68	9.95	3.36
0.967	2.40	3.967	3.84	6.967	7.68	9.97	3.36
0.983	2.40	3.983	3.84	6.983	7.68	9.98	3.36
1.000	2.40	4.000	3.84	7.000	7.67	10.00	3.36
1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92

1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92
1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92
2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92
2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92
2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92

2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92
2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Max.Eff.Inten.(mm/hr)=	126.68	181.67		
over (min)	5.00	5.00		
Storage Coeff. (min)=	1.89 (ii)	4.77 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.38	0.23		
			TOTALS	
PEAK FLOW (cms)=	0.20	0.03	0.230 (iii)	
TIME TO PEAK (hrs)=	6.00	6.02	6.00	
RUNOFF VOLUME (mm)=	94.97	43.31	81.53	
TOTAL RAINFALL (mm)=	95.97	95.97	95.97	
RUNOFF COEFFICIENT =	0.99	0.45	0.85	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0011)	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	0.0912	0.0179
	0.0006	0.0005	0.1027	0.0204
	0.0062	0.0056	0.1264	0.0248
	0.0100	0.0060	0.1349	0.0263
	0.0470	0.0101	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0006)	0.750	0.230	6.00	81.53
OUTFLOW: ID= 1 (0011)	0.750	0.112	6.08	81.25

PEAK FLOW REDUCTION [Qout/Qin](%)= 48.80
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0222

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.20
|ID= 1 DT= 1.0 min |   Total Imp(%)=  59.00   Dir. Conn.(%)=  45.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.30         0.90
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     121.11        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    2.40 | 3.017    3.84 | 6.017   17.27 |  9.02    3.36
 0.033    2.40 | 3.033    3.84 | 6.033   17.27 |  9.03    3.36
 0.050    2.40 | 3.050    3.84 | 6.050   17.27 |  9.05    3.36
 0.067    2.40 | 3.067    3.84 | 6.067   17.27 |  9.07    3.36
 0.083    2.40 | 3.083    3.84 | 6.083   17.27 |  9.08    3.36
 0.100    2.40 | 3.100    3.84 | 6.100   17.27 |  9.10    3.36
 0.117    2.40 | 3.117    3.84 | 6.117   17.27 |  9.12    3.36
 0.133    2.40 | 3.133    3.84 | 6.133   17.27 |  9.13    3.36
 0.150    2.40 | 3.150    3.84 | 6.150   17.27 |  9.15    3.36
 0.167    2.40 | 3.167    3.84 | 6.167   17.27 |  9.17    3.36
 0.183    2.40 | 3.183    3.84 | 6.183   17.27 |  9.18    3.36
 0.200    2.40 | 3.200    3.84 | 6.200   17.27 |  9.20    3.36
 0.217    2.40 | 3.217    3.84 | 6.217   17.27 |  9.22    3.36
 0.233    2.40 | 3.233    3.84 | 6.233   17.27 |  9.23    3.36
 0.250    2.40 | 3.250    3.84 | 6.250   17.27 |  9.25    3.36
 0.267    2.40 | 3.267    3.84 | 6.267   17.27 |  9.27    3.36
 0.283    2.40 | 3.283    3.84 | 6.283   17.27 |  9.28    3.36
 0.300    2.40 | 3.300    3.84 | 6.300   17.27 |  9.30    3.36
 0.317    2.40 | 3.317    3.84 | 6.317   17.27 |  9.32    3.36
 0.333    2.40 | 3.333    3.84 | 6.333   17.27 |  9.33    3.36
 0.350    2.40 | 3.350    3.84 | 6.350   17.27 |  9.35    3.36
 0.367    2.40 | 3.367    3.84 | 6.367   17.27 |  9.37    3.36
 0.383    2.40 | 3.383    3.84 | 6.383   17.27 |  9.38    3.36
 0.400    2.40 | 3.400    3.84 | 6.400   17.27 |  9.40    3.36
 0.417    2.40 | 3.417    3.84 | 6.417   17.27 |  9.42    3.36
 0.433    2.40 | 3.433    3.84 | 6.433   17.27 |  9.43    3.36
 0.450    2.40 | 3.450    3.84 | 6.450   17.27 |  9.45    3.36
 0.467    2.40 | 3.467    3.84 | 6.467   17.27 |  9.47    3.36
 0.483    2.40 | 3.483    3.84 | 6.483   17.27 |  9.48    3.36
 0.500    2.40 | 3.500    3.84 | 6.500   17.26 |  9.50    3.36
 0.517    2.40 | 3.517    3.84 | 6.517    7.68 |  9.52    3.36
 0.533    2.40 | 3.533    3.84 | 6.533    7.68 |  9.53    3.36
 0.550    2.40 | 3.550    3.84 | 6.550    7.68 |  9.55    3.36
 0.567    2.40 | 3.567    3.84 | 6.567    7.68 |  9.57    3.36
 0.583    2.40 | 3.583    3.84 | 6.583    7.68 |  9.58    3.36
 0.600    2.40 | 3.600    3.84 | 6.600    7.68 |  9.60    3.36
 0.617    2.40 | 3.617    3.84 | 6.617    7.68 |  9.62    3.36
 0.633    2.40 | 3.633    3.84 | 6.633    7.68 |  9.63    3.36
 0.650    2.40 | 3.650    3.84 | 6.650    7.68 |  9.65    3.36
 0.667    2.40 | 3.667    3.84 | 6.667    7.68 |  9.67    3.36
 0.683    2.40 | 3.683    3.84 | 6.683    7.68 |  9.68    3.36
 0.700    2.40 | 3.700    3.84 | 6.700    7.68 |  9.70    3.36
 0.717    2.40 | 3.717    3.84 | 6.717    7.68 |  9.72    3.36
 0.733    2.40 | 3.733    3.84 | 6.733    7.68 |  9.73    3.36
 0.750    2.40 | 3.750    3.84 | 6.750    7.68 |  9.75    3.36
 0.767    2.40 | 3.767    3.84 | 6.767    7.68 |  9.77    3.36
 0.783    2.40 | 3.783    3.84 | 6.783    7.68 |  9.78    3.36
 0.800    2.40 | 3.800    3.84 | 6.800    7.68 |  9.80    3.36
 0.817    2.40 | 3.817    3.84 | 6.817    7.68 |  9.82    3.36
 0.833    2.40 | 3.833    3.84 | 6.833    7.68 |  9.83    3.36
 0.850    2.40 | 3.850    3.84 | 6.850    7.68 |  9.85    3.36
 0.867    2.40 | 3.867    3.84 | 6.867    7.68 |  9.87    3.36
 0.883    2.40 | 3.883    3.84 | 6.883    7.68 |  9.88    3.36
 0.900    2.40 | 3.900    3.84 | 6.900    7.68 |  9.90    3.36
 0.917    2.40 | 3.917    3.84 | 6.917    7.68 |  9.92    3.36
 0.933    2.40 | 3.933    3.84 | 6.933    7.68 |  9.93    3.36
 0.950    2.40 | 3.950    3.84 | 6.950    7.68 |  9.95    3.36
 0.967    2.40 | 3.967    3.84 | 6.967    7.68 |  9.97    3.36
 0.983    2.40 | 3.983    3.84 | 6.983    7.68 |  9.98    3.36
 1.000    2.40 | 4.000    3.84 | 7.000    7.67 | 10.00    3.36
```

1.017	2.40	4.017	5.76	7.017	5.76	10.02	1.92
1.033	2.40	4.033	5.76	7.033	5.76	10.03	1.92
1.050	2.40	4.050	5.76	7.050	5.76	10.05	1.92
1.067	2.40	4.067	5.76	7.067	5.76	10.07	1.92
1.083	2.40	4.083	5.76	7.083	5.76	10.08	1.92
1.100	2.40	4.100	5.76	7.100	5.76	10.10	1.92
1.117	2.40	4.117	5.76	7.117	5.76	10.12	1.92
1.133	2.40	4.133	5.76	7.133	5.76	10.13	1.92
1.150	2.40	4.150	5.76	7.150	5.76	10.15	1.92
1.167	2.40	4.167	5.76	7.167	5.76	10.17	1.92
1.183	2.40	4.183	5.76	7.183	5.76	10.18	1.92
1.200	2.40	4.200	5.76	7.200	5.76	10.20	1.92
1.217	2.40	4.217	5.76	7.217	5.76	10.22	1.92
1.233	2.40	4.233	5.76	7.233	5.76	10.23	1.92
1.250	2.40	4.250	5.76	7.250	5.76	10.25	1.92
1.267	2.40	4.267	5.76	7.267	5.76	10.27	1.92
1.283	2.40	4.283	5.76	7.283	5.76	10.28	1.92
1.300	2.40	4.300	5.76	7.300	5.76	10.30	1.92
1.317	2.40	4.317	5.76	7.317	5.76	10.32	1.92
1.333	2.40	4.333	5.76	7.333	5.76	10.33	1.92
1.350	2.40	4.350	5.76	7.350	5.76	10.35	1.92
1.367	2.40	4.367	5.76	7.367	5.76	10.37	1.92
1.383	2.40	4.383	5.76	7.383	5.76	10.38	1.92
1.400	2.40	4.400	5.76	7.400	5.76	10.40	1.92
1.417	2.40	4.417	5.76	7.417	5.76	10.42	1.92
1.433	2.40	4.433	5.76	7.433	5.76	10.43	1.92
1.450	2.40	4.450	5.76	7.450	5.76	10.45	1.92
1.467	2.40	4.467	5.76	7.467	5.76	10.47	1.92
1.483	2.40	4.483	5.76	7.483	5.76	10.48	1.92
1.500	2.40	4.500	5.76	7.500	5.76	10.50	1.92
1.517	2.40	4.517	7.68	7.517	5.76	10.52	1.92
1.533	2.40	4.533	7.68	7.533	5.76	10.53	1.92
1.550	2.40	4.550	7.68	7.550	5.76	10.55	1.92
1.567	2.40	4.567	7.68	7.567	5.76	10.57	1.92
1.583	2.40	4.583	7.68	7.583	5.76	10.58	1.92
1.600	2.40	4.600	7.68	7.600	5.76	10.60	1.92
1.617	2.40	4.617	7.68	7.617	5.76	10.62	1.92
1.633	2.40	4.633	7.68	7.633	5.76	10.63	1.92
1.650	2.40	4.650	7.68	7.650	5.76	10.65	1.92
1.667	2.40	4.667	7.68	7.667	5.76	10.67	1.92
1.683	2.40	4.683	7.68	7.683	5.76	10.68	1.92
1.700	2.40	4.700	7.68	7.700	5.76	10.70	1.92
1.717	2.40	4.717	7.68	7.717	5.76	10.72	1.92
1.733	2.40	4.733	7.68	7.733	5.76	10.73	1.92
1.750	2.40	4.750	7.68	7.750	5.76	10.75	1.92
1.767	2.40	4.767	7.68	7.767	5.76	10.77	1.92
1.783	2.40	4.783	7.68	7.783	5.76	10.78	1.92
1.800	2.40	4.800	7.68	7.800	5.76	10.80	1.92
1.817	2.40	4.817	7.68	7.817	5.76	10.82	1.92
1.833	2.40	4.833	7.68	7.833	5.76	10.83	1.92
1.850	2.40	4.850	7.68	7.850	5.76	10.85	1.92
1.867	2.40	4.867	7.68	7.867	5.76	10.87	1.92
1.883	2.40	4.883	7.68	7.883	5.76	10.88	1.92
1.900	2.40	4.900	7.68	7.900	5.76	10.90	1.92
1.917	2.40	4.917	7.68	7.917	5.76	10.92	1.92
1.933	2.40	4.933	7.68	7.933	5.76	10.93	1.92
1.950	2.40	4.950	7.68	7.950	5.76	10.95	1.92
1.967	2.40	4.967	7.68	7.967	5.76	10.97	1.92
1.983	2.40	4.983	7.68	7.983	5.76	10.98	1.92
2.000	2.40	5.000	7.68	8.000	5.75	11.00	1.92
2.017	2.88	5.017	11.52	8.017	3.36	11.02	1.92
2.033	2.88	5.033	11.52	8.033	3.36	11.03	1.92
2.050	2.88	5.050	11.52	8.050	3.36	11.05	1.92
2.067	2.88	5.067	11.52	8.067	3.36	11.07	1.92
2.083	2.88	5.083	11.52	8.083	3.36	11.08	1.92
2.100	2.88	5.100	11.52	8.100	3.36	11.10	1.92
2.117	2.88	5.117	11.52	8.117	3.36	11.12	1.92
2.133	2.88	5.133	11.52	8.133	3.36	11.13	1.92
2.150	2.88	5.150	11.52	8.150	3.36	11.15	1.92
2.167	2.88	5.167	11.52	8.167	3.36	11.17	1.92
2.183	2.88	5.183	11.52	8.183	3.36	11.18	1.92
2.200	2.88	5.200	11.52	8.200	3.36	11.20	1.92
2.217	2.88	5.217	11.52	8.217	3.36	11.22	1.92
2.233	2.88	5.233	11.52	8.233	3.36	11.23	1.92
2.250	2.88	5.250	11.52	8.250	3.36	11.25	1.92
2.267	2.88	5.267	11.52	8.267	3.36	11.27	1.92
2.283	2.88	5.283	11.52	8.283	3.36	11.28	1.92
2.300	2.88	5.300	11.52	8.300	3.36	11.30	1.92
2.317	2.88	5.317	11.52	8.317	3.36	11.32	1.92

2.333	2.88	5.333	11.52	8.333	3.36	11.33	1.92
2.350	2.88	5.350	11.52	8.350	3.36	11.35	1.92
2.367	2.88	5.367	11.52	8.367	3.36	11.37	1.92
2.383	2.88	5.383	11.52	8.383	3.36	11.38	1.92
2.400	2.88	5.400	11.52	8.400	3.36	11.40	1.92
2.417	2.88	5.417	11.52	8.417	3.36	11.42	1.92
2.433	2.88	5.433	11.52	8.433	3.36	11.43	1.92
2.450	2.88	5.450	11.52	8.450	3.36	11.45	1.92
2.467	2.88	5.467	11.52	8.467	3.36	11.47	1.92
2.483	2.88	5.483	11.52	8.483	3.36	11.48	1.92
2.500	2.88	5.500	11.55	8.500	3.36	11.50	1.92
2.517	2.88	5.517	46.07	8.517	3.36	11.52	1.92
2.533	2.88	5.533	46.07	8.533	3.36	11.53	1.92
2.550	2.88	5.550	46.07	8.550	3.36	11.55	1.92
2.567	2.88	5.567	46.07	8.567	3.36	11.57	1.92
2.583	2.88	5.583	46.07	8.583	3.36	11.58	1.92
2.600	2.88	5.600	46.07	8.600	3.36	11.60	1.92
2.617	2.88	5.617	46.07	8.617	3.36	11.62	1.92
2.633	2.88	5.633	46.07	8.633	3.36	11.63	1.92
2.650	2.88	5.650	46.07	8.650	3.36	11.65	1.92
2.667	2.88	5.667	46.07	8.667	3.36	11.67	1.92
2.683	2.88	5.683	46.07	8.683	3.36	11.68	1.92
2.700	2.88	5.700	46.07	8.700	3.36	11.70	1.92
2.717	2.88	5.717	46.07	8.717	3.36	11.72	1.92
2.733	2.88	5.733	46.07	8.733	3.36	11.73	1.92
2.750	2.88	5.750	46.16	8.750	3.36	11.75	1.92
2.767	2.88	5.767	126.68	8.767	3.36	11.77	1.92
2.783	2.88	5.783	126.68	8.783	3.36	11.78	1.92
2.800	2.88	5.800	126.68	8.800	3.36	11.80	1.92
2.817	2.88	5.817	126.68	8.817	3.36	11.82	1.92
2.833	2.88	5.833	126.68	8.833	3.36	11.83	1.92
2.850	2.88	5.850	126.68	8.850	3.36	11.85	1.92
2.867	2.88	5.867	126.68	8.867	3.36	11.87	1.92
2.883	2.88	5.883	126.68	8.883	3.36	11.88	1.92
2.900	2.88	5.900	126.68	8.900	3.36	11.90	1.92
2.917	2.88	5.917	126.68	8.917	3.36	11.92	1.92
2.933	2.88	5.933	126.68	8.933	3.36	11.93	1.92
2.950	2.88	5.950	126.68	8.950	3.36	11.95	1.92
2.967	2.88	5.967	126.68	8.967	3.36	11.97	1.92
2.983	2.88	5.983	126.68	8.983	3.36	11.98	1.92
3.000	2.88	6.000	126.53	9.000	3.36	12.00	1.92

Max.Eff.Inten.(mm/hr)=	126.68	60.60	
over (min)	5.00	9.00	
Storage Coeff. (min)=	2.61 (ii)	8.79 (ii)	
Unit Hyd. Tpeak (min)=	5.00	9.00	
Unit Hyd. peak (cms)=	0.33	0.13	
			TOTALS
PEAK FLOW (cms)=	0.35	0.11	0.448 (iii)
TIME TO PEAK (hrs)=	6.00	6.07	6.00
RUNOFF VOLUME (mm)=	94.97	27.83	58.04
TOTAL RAINFALL (mm)=	95.97	95.97	95.97
RUNOFF COEFFICIENT =	0.99	0.29	0.60

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)| IN= 2---> OUT= 1 | DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0570	0.0442
	0.0008	0.0012	0.0640	0.0503
	0.0063	0.0138	0.0780	0.0611
	0.0090	0.0149	0.0830	0.0649
	0.0320	0.0249	0.0000	0.0000

OVERFLOW IS OFF

**** WARNING : STORAGE-DISCHARGE TABLE WAS EXCEEDED.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0008)	2.200	0.448	6.00	58.04
OUTFLOW: ID= 1 (0010)	2.200	0.084	6.40	57.87

```
                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.78
                  TIME SHIFT OF PEAK FLOW         (min)= 24.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0658

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0039)|   Area    (ha)=   0.08
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.04
     Dep. Storage     (mm)=       1.00         2.30
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      23.09        40.00
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.40 | 3.083    3.84 | 6.083   17.27 |  9.08    3.36
               0.167    2.40 | 3.167    3.84 | 6.167   17.27 |  9.17    3.36
               0.250    2.40 | 3.250    3.84 | 6.250   17.27 |  9.25    3.36
               0.333    2.40 | 3.333    3.84 | 6.333   17.27 |  9.33    3.36
               0.417    2.40 | 3.417    3.84 | 6.417   17.27 |  9.42    3.36
               0.500    2.40 | 3.500    3.84 | 6.500   17.27 |  9.50    3.36
               0.583    2.40 | 3.583    3.84 | 6.583    7.68 |  9.58    3.36
               0.667    2.40 | 3.667    3.84 | 6.667    7.68 |  9.67    3.36
               0.750    2.40 | 3.750    3.84 | 6.750    7.68 |  9.75    3.36
               0.833    2.40 | 3.833    3.84 | 6.833    7.68 |  9.83    3.36
               0.917    2.40 | 3.917    3.84 | 6.917    7.68 |  9.92    3.36
               1.000    2.40 | 4.000    3.84 | 7.000    7.68 | 10.00    3.36
               1.083    2.40 | 4.083    5.76 | 7.083    5.76 | 10.08    1.92
               1.167    2.40 | 4.167    5.76 | 7.167    5.76 | 10.17    1.92
               1.250    2.40 | 4.250    5.76 | 7.250    5.76 | 10.25    1.92
               1.333    2.40 | 4.333    5.76 | 7.333    5.76 | 10.33    1.92
               1.417    2.40 | 4.417    5.76 | 7.417    5.76 | 10.42    1.92
               1.500    2.40 | 4.500    5.76 | 7.500    5.76 | 10.50    1.92
               1.583    2.40 | 4.583    7.68 | 7.583    5.76 | 10.58    1.92
               1.667    2.40 | 4.667    7.68 | 7.667    5.76 | 10.67    1.92
               1.750    2.40 | 4.750    7.68 | 7.750    5.76 | 10.75    1.92
               1.833    2.40 | 4.833    7.68 | 7.833    5.76 | 10.83    1.92
               1.917    2.40 | 4.917    7.68 | 7.917    5.76 | 10.92    1.92
               2.000    2.40 | 5.000    7.68 | 8.000    5.76 | 11.00    1.92
               2.083    2.88 | 5.083   11.52 | 8.083    3.36 | 11.08    1.92
               2.167    2.88 | 5.167   11.52 | 8.167    3.36 | 11.17    1.92
               2.250    2.88 | 5.250   11.52 | 8.250    3.36 | 11.25    1.92
               2.333    2.88 | 5.333   11.52 | 8.333    3.36 | 11.33    1.92
               2.417    2.88 | 5.417   11.52 | 8.417    3.36 | 11.42    1.92
               2.500    2.88 | 5.500   11.52 | 8.500    3.36 | 11.50    1.92
               2.583    2.88 | 5.583   46.07 | 8.583    3.36 | 11.58    1.92
               2.667    2.88 | 5.667   46.07 | 8.667    3.36 | 11.67    1.92
               2.750    2.88 | 5.750   46.07 | 8.750    3.36 | 11.75    1.92
               2.833    2.88 | 5.833  126.68 | 8.833    3.36 | 11.83    1.92
               2.917    2.88 | 5.917  126.68 | 8.917    3.36 | 11.92    1.92
               3.000    2.88 | 6.000  126.68 | 9.000    3.36 | 12.00    1.92

     Max.Eff.Inten.(mm/hr)=     126.68       158.89
                 over (min)        5.00        10.00
     Storage Coeff.  (min)=       0.96 (ii)    6.83 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.34         0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.02          0.025 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      94.97        83.19          87.27
     TOTAL RAINFALL   (mm)=      95.97        95.97          95.97
     RUNOFF COEFFICIENT   =       0.99         0.87           0.91

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  94.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.20   0.084     6.40    57.87
      + ID2= 2 (  0011):     0.75   0.112     6.08    81.25
        ====================================================
        ID = 3 (  0004):     2.95   0.190     6.10    63.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):     2.95   0.190     6.10    63.81
      + ID2= 2 (  0027):    16.11   0.502     6.97    32.31
        ====================================================
        ID = 1 (  0004):    19.06   0.618     6.82    37.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    19.06   0.618     6.82    37.18
      + ID2= 2 (  0003):     4.63   0.026    10.08    39.20
        ====================================================
        ID = 3 (  0004):    23.69   0.641     6.82    37.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0004):    23.69   0.641     6.82    37.58
      + ID2= 2 (  0039):     0.08   0.025     6.00    87.27
        ====================================================
        ID = 1 (  0004):    23.77   0.643     6.82    37.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0004):    23.77   0.643     6.82    37.75
      + ID2= 2 (  0009):     2.02   0.425     6.00    57.78
        ====================================================
        ID = 3 (  0004):    25.79   0.752     6.02    39.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

APPENDIX E

FLOODPLAIN HYDRAULICS

FLOODPLAIN STORAGE CALCULATIONS

Existing Conditions

HEC-RAS Section Flow Areas (m^2)

Distance (m)	0.0	18.7	38.2	39.5	31.7	26.3	38.1	26.5	34.6	12.5	30.9	44.8	39.2	54.5	64.7	
EL\Sta.	3108.5	3108.3	3108.25	3108	3107.75	3107.5	3107.45	3107.4	3107.3	3107.2	3107	3106.75	3106.5	3106.4	3106	EL
331.50	16.0															331.50
331.25	23.4	25.1														331.25
331.00	12.1	21.3	15.9	1.9												331.00
330.75	7.8	11.1	17.1	21.1	12.3	15.5										330.75
330.50	4.0	3.7	8.8	16.1	20.6	32.8	3.4									330.50
330.25	0.6	0.1	2.3	6.4	13.7	22.7	23.6	17.5	1.4							330.25
330.00			0.2	0.4	1.0	7.2	14.0	17.3	16.3	14.8	4.5					330.00
329.75						0.3	4.0	11.4	13.0	14.3	12.4	7.6	3.7	25.4	11.2	329.75
329.50							0.2	6.6	9.0	10.6	9.8	10.6	14.0	22.0	37.5	329.50
329.25								0.2	5.4	6.9	6.4	7.8	11.1	17.7	20.6	329.25
329.00									0.1	1.1	1.8	3.2	7.0	13.5	15.8	329.00
328.75												0.1	1.4	8.3	13.1	328.75
328.50														1.3	9.7	328.50
328.25															1.8	328.25

Storage Volume Between Sections (m^3)

EL\Sta.	3108.5	3108.3	3108.25	3108	3107.75	3107.5		3107.4	3107.3	3107.2	3107	3106.75	3106.5	3106.4	3106	Total	EL
331.50		149														149.3	331.50
331.25		453	480													933.1	331.25
331.00		311	710	350	29											1400.5	331.00
330.75		177	539	754	529	365	295									2660.1	330.75
330.50		72	241	492	581	701	688	45								2819.9	330.50
330.25		7	46	171	319	479	882	544	328	9						2785.1	330.25
330.00			3	11	22	109	405	415	582	194	298	101				2139.9	330.00
329.75						3	82	204	423	171	412	448	223	792	1182	3940.7	329.75
329.50							3	90	271	123	316	459	483	980	1927	4653.0	329.50
329.25								3	97	77	207	319	371	785	1240	3098.9	329.25
329.00									3	8	45	113	201	559	948	1875.6	329.00
328.75												1	29	265	694	988.5	328.75
328.50														35	357	391.9	328.50
328.25															59	59.0	328.25
Total	0	1169	2019	1778	1481	1657	2355	1301	1705	582	1278	1441	1306	3416	6406	**27896**	

$$V_{EL,Sta} = \frac{A_{EL,Sta-1} + A_{EL,Sta}}{2} * L_{Sta-1,Sta}$$

Where

V = Storage volume at elevtion increment between sections (m^3)
A = Incremental elevation area within section below flood elevation (m^2)
L = Characteristic distance between sections (m)

Post-Development Conditions

HEC-RAS Section Flow Areas (m^2)

Distance (m)	0.0	18.7	38.2	39.5	31.7	26.3	38.1	26.5	34.6	12.5	30.9	44.8	39.2	54.5	64.7	
EL\Sta.	3108.5	3108.3	3108.25	3108	3107.75	3107.5	3107.45	3107.4	3107.3	3107.2	3107	3106.75	3106.5	3106.4	3106	EL
331.75	9.6															331.75
331.50	19.4	26.2														331.50
331.25	26.3	24.2	13													331.25
331.00	14.9	11.6	24.5	27.7	26.9	24.2	12.7	3.6	2.7							331.00
330.75	9.3	2.4	13.6	32.9	35.0	32.2	21.4	10.8	9.6	1.8						330.75
330.50	5.5	1.7	2.5	22.0	29.9	23.4	19.8	10.2	9.5	4.8						330.50
330.25	0.6	0.3	1.5	5.8	15.5	19.1	16.3	9.6	9.3	4.6	6.8	3.8				330.25
330.00			0.4	2.1	2.0	7.4	11.1	9.0	8.9	4.4	8.3	8.4	0.6			330.00
329.75				0.9	1.6	2.1	3.5	7.6	8.5	4.2	7.6	8.1	7.6	3.4	11.2	329.75
329.50					0.1	1.0	2.0	2.0	4.2	3.3	6.4	7.5	7.0	14.0	37.5	329.50
329.25							0.6	1.6	1.8	1.8	1.8	2.4	3.1	13.6	20.6	329.25
329.00								0.1	0.8	1.0	1.4	1.6	1.8	12.1	14.5	329.00
328.75												0.3	0.8	9.9	13.1	328.75
328.50														7.2	9.7	328.50
328.25															1.8	328.25

Storage Volume Between Sections (m^3)

EL\Sta.	3108.5	3108.3	3108.25	3108	3107.75	3107.5	3107.45	3107.4	3107.3	3107.2	3107	3106.75	3106.5	3106.4	3106	Total	EL
331.75		90														89.7	331.75
331.50		426	501													927.0	331.50
331.25		471	706	252												1429.6	331.25
331.00		247	689	1031	865	671	703	216	109							4530	331.00
330.75		109	305	916	1075	883	1021	426	354							5088	330.75
330.50		66	79	484	823	700	821	396	341	89	74					3873	330.50
330.25		9	36	145	337	454	674	343	327	87	176	239				2826	330.25
330.00			7	48	66	124	352	266	310	83	196	376	178			2005	330.00
329.75				18	40	48	106	148	279	79	182	350	306	297	469	2323	329.75
329.50					2	15	57	52	106	46	150	312	284	573	1669	3266	329.50
329.25							11	28	58	22	56	94	107	454	1107	1938	329.25
329.00									14	11	38	67	65	378	861	1436	329.00
328.75												7	21	290	744	1063	328.75
328.50													0	197	549	746	328.50
328.25															59	59	328.25
Total	0	1419	2323	2893	3206	2897	3744	1875	1899	418	872	1445	962	2190	5459	**31601**	

$$V_{EL,Sta} = \frac{A_{EL,Sta-1} + A_{EL,Sta}}{2} * L_{Sta-1,Sta}$$

Where

V = Storage volume at elevtion increment between sections (m^3)
A = Incremental elevation area within section below flood elevation (m^2)
L = Characteristic distance between sections (m)

Floodplain Storage by 0.25m Elevation Increment (m^3)

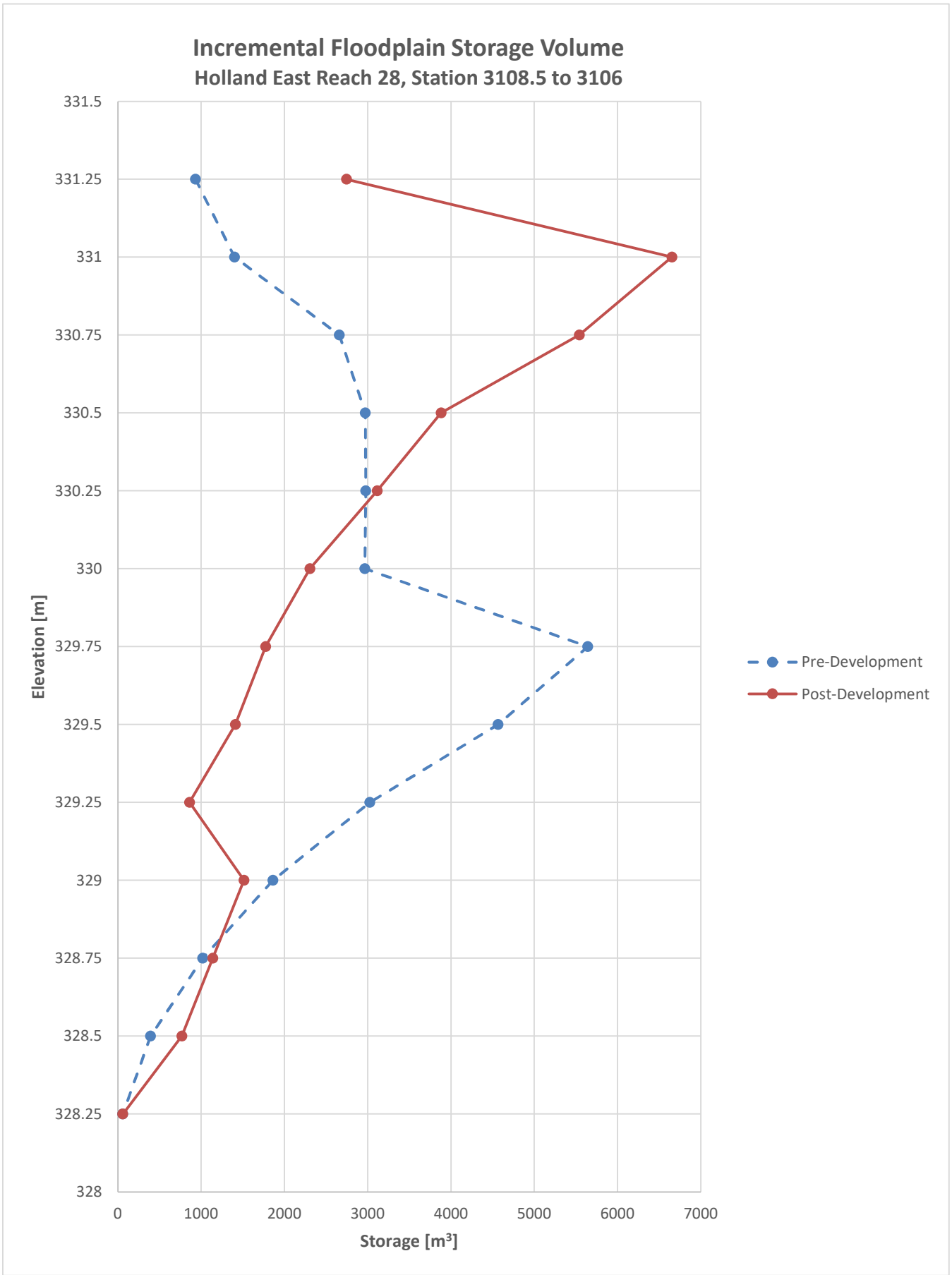
EL	Pre	Post	Delta	% Change
331.75	0	90	90	-
331.5	149	927	778	521
331.25	933	1430	496	53
331.00	1401	4530	3130	223
330.75	2660	5088	2428	91
330.50	2820	3873	1054	37
330.25	2785	2826	41	1
330.00	2140	2005	-135	-6
329.75	3941	2323	-1617	-41
329.50	4653	3266	-1387	-30
329.25	3099	1938	-1161	-37
329.00	1876	1436	-440	-23
328.75	989	1063	74	7
328.50	392	746	354	90
328.25	59	59	0	0
Total	27896	31601	3705	

Net Increase 13.3%

Floodplain Storage by HEC-RAS Cross Section (m^3)

HEC-RAS Section	Pre	Post	Delta	% Change
3108.5	0	0	0	0
3108.3	1169	1419	249	21
3108.25	2019	2323	304	15
3108	1778	2893	1115	63
3107.75	1481	3206	1725	116
3107.5	1657	2897	1239	75
3107.45	2355	3744	1389	59
3107.4	1301	1875	574	44
3107.35*	-	-	-	-
3107.35*	-	-	-	-
3107.3	1705	1899	194	11
3107.2	582	418	-164	-28
3107	1278	872	-406	-32
3106.75	1441	1445	5	0
3106.5	1306	962	-345	-26
3106.4	3416	2190	-1227	-36
3106	6406	5459	-947	-15
Total	27896	31601	3705	13.3

*Upstream and downstream bridge sections


Incremental Floodplain Storage Volume
Holland East Reach 28, Station 3108.5 to 3106
331.5
331.25
331
330.75
330.5
330.25
330
329.75
329.5
329.25
329
328.75
328.5
328.25
328
Elevation [m]
0
1000
2000
3000
4000
5000
6000
7000
Storage [m³]
Pre-Development
Post-Development

HEC-RAS Plan: EX-REGIONAL Locations: User Defined Profile: Reg

River	Reach	River Sta.	Profile	Q Total	Min CH El	W.S. Elev	Crit W.S	E.G. Elev	E.G Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Holland East	28	3110	Reg	47.7	330.69	332.82	331.43	332.82	0.000006	0.11	584.73	497.37	0.03
Holland East	28	3109.5		Culvert									
Holland East	28	3109	Reg	47.7	330.54	332.25	332.25	332.26	0.000285	0.48	178.91	415.62	0.17
Holland East	28	3108.75	Reg	47.7	330.53	331.71		331.72	0.000525	0.75	136.49	308.42	0.24
Holland East	28	3108.6	Reg	47.7	330.51	331.68		331.69	0.000657	0.75	125.05	296.07	0.26
Holland East	28	3108.5	Reg	47.7	330.6	331.61		331.64	0.002812	1.19	62.66	149.73	0.5
Holland East	28	3108.3	Reg	47.7	330.42	331.44		331.47	0.002908	1.23	60.9	145.43	0.51
Holland East	28	3108.25	Reg	47.7	330.13	331.18		331.25	0.004629	1.54	44.6	95.08	0.65
Holland East	28	3108	Reg	47.7	330.02	331.02		331.08	0.004245	1.48	45.83	93.78	0.61
Holland East	28	3107.75	Reg	47.7	330.14	330.88		330.93	0.004512	1.28	48.15	108.71	0.61
Holland East	28	3107.5	Reg	47.7	329.85	330.85		330.87	0.001648	0.92	79.78	181.91	0.38
Holland East	28	3107.45	Reg	47.7	330	330.53	330.52	330.65	0.019088	2.23	31.74	113.79	1.2
Holland East	28	3107.4	Reg	47.7	329.45	330.39		330.44	0.001898	1.37	56.87	102.68	0.46
Holland East	28	3107.3	Reg	47.7	329.32	330.27		330.36	0.002391	1.49	43.09	74.27	0.51
Holland East	28	3107.2	Reg	47.7	329.24	330.21		330.29	0.001985	1.34	44.81	76.22	0.46
Holland East	28	3107	Reg	47.7	329.1	330.08		330.21	0.00349	1.7	33.47	58.72	0.61
Holland East	28	3106.75	Reg	47.7	328.98	329.9		330.07	0.005224	1.83	28.17	53.44	0.72
Holland East	28	3106.5	Reg	47.7	328.74	329.81		329.93	0.003352	1.85	37.01	63.64	0.61
Holland East	28	3106.4	Reg	47.7	328.48	329.81		329.84	0.00054	0.93	75.59	96.09	0.26
Holland East	28	3106	Reg	47.7	328.24	329.81	328.84	329.82	0.000076	0.33	157.44	160.4	0.1
Holland East	28	3105.6		Culvert									
Holland East	28	3105	Reg	47.7	327.72	329.3	329.1	329.39	0.002068	1.55	44.15	72.66	0.49
Holland East	28	3104	Reg	47.7	327.79	328.76		328.83	0.001595	1.3	44.74	59.16	0.42
Holland East	28	3103	Reg	47.7	326.89	328.3		328.38	0.001399	1.42	47.88	67.04	0.41
Holland East	28	3102	Reg	47.7	326.41	327.54	327.43	327.73	0.004653	2.17	30.18	54.16	0.72
Holland East	28	3101	Reg	47.7	325.04	326.11	326.11	326.45	0.00797	2.91	21.84	34.89	0.94
Holland East	28	3100	Reg	47.7	320.48	322.69	321.03	322.69	0.000008	0.14	437.72	240.96	0.03

HEC-RAS Plan: PostReg Locations: User Defined Profile: Reg

River	Reach	River Sta.	Profile	Q Total	Min CH El	W.S. Elev	Crit W.S	E.G. Elev	E.G Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Holland East	28	3110	Reg	47.7	330.69	332.82	331.43	332.82	0.000006	0.11	584.73	497.37	0.03
Holland East	28	3109.5		Culvert									
Holland East	28	3109	Reg	47.7	330.54	332.25	332.25	332.26	0.000285	0.48	178.91	415.62	0.17
Holland East	28	3108.75	Reg	47.7	330.53	331.75		331.76	0.000388	0.66	150.58	312.88	0.21
Holland East	28	3108.6	Reg	47.7	330.51	331.74	331.5	331.74	0.000459	0.66	140.69	302.2	0.22
Holland East	28	3108.5	Reg	47.7	330.5	331.71		331.72	0.000446	0.75	125.92	228.06	0.23
Holland East	28	3108.3	Reg	47.7	330.44	331.52	331.52	331.66	0.004962	2.31	43.33	124.38	0.74
Holland East	28	3108.25	Reg	47.7	330.18	331.2		331.3	0.004365	2.07	45.6	113.14	0.69
Holland East	28	3108	Reg	47.7	329.87	331.2	330.83	331.22	0.0006	0.94	92.88	146.66	0.27
Holland East	28	3107.75	Reg	47.7	329.73	331.19	330.7	331.21	0.000354	0.77	111.45	149.16	0.21
Holland East	28	3107.5	Reg	47.7	329.58	331.18	330.56	331.19	0.000411	0.88	103.73	156.5	0.23
Holland East	28	3107.45	Reg	47.7	329.41	331.15	330.5	331.18	0.000468	0.99	87.8	120.41	0.25
Holland East	28	3107.4	Reg	47.7	329.24	331.09		331.14	0.000729	1.3	54.81	45.23	0.31
Holland East	28	3107.3	Reg	47.7	329.12	331.07		331.11	0.000619	1.24	54.95	39.01	0.29
Holland East	28	3107.2	Reg	47.7	329.08	330.84	330.4	331.08	0.002668	2.39	23.43	19.8	0.59
Holland East	28	3107.1	Reg	Bridge									
Holland East	28	3107	Reg	47.7	329	330.44	330.17	330.63	0.003288	2.3	27.66	36.57	0.63
Holland East	28	3106.75	Reg	47.7	328.94	330.36	330.08	330.51	0.002826	2.12	32.22	35.25	0.59
Holland East	28	3106.5	Reg	47.7	328.87	330.02	330.02	330.36	0.008119	3.09	21.89	31.17	0.96
Holland East	28	3106.4	Reg	47.7	328.5	329.81		329.84	0.000509	0.84	60.6	57.83	0.25
Holland East	28	3106	Reg	47.7	328.24	329.82	328.84	329.82	0.000076	0.33	157.61	160.49	0.1
Holland East	28	3105.6		Culvert									
Holland East	28	3105	Reg	47.7	327.72	329.31	329.1	329.4	0.002136	1.58	42.4	67.66	0.49
Holland East	28	3104	Reg	47.7	327.79	328.76		328.83	0.001595	1.3	44.74	59.16	0.42
Holland East	28	3103	Reg	47.7	326.89	328.3		328.38	0.001397	1.42	47.9	67.06	0.41
Holland East	28	3102	Reg	47.7	326.41	327.54	327.43	327.73	0.004673	2.17	30.13	54.11	0.72
Holland East	28	3101	Reg	47.7	325.04	326.11	326.11	326.45	0.00797	2.91	21.84	34.89	0.94
Holland East	28	3100	Reg	47.7	320.48	322.69	321.03	322.69	0.000008	0.14	437.72	240.96	0.03

Further, the constraction coefficient should be read from the following chart:

Table B-4 Contraction Coefficient Values

Degree of Constriction	Recommended Contraction Coefficient
$0.0 < b/B < 0.25$	0.3 - 0.5
$0.25 < b/B < 0.50$	0.1 - 0.3
$0.50 < b/B < 1.0$	0.1

Therefore: (refer to page B-10 of the manual)

C_c 0.3-0.5

The following calculations are provided in response to LSRCA comment #E3:

LSRCA Comment E3: Given the abrupt reduction in the width of the flood plain at the proposed bridge, contraction and expansion coefficients of 0.6 and 0.8 (respectively) would be more suitable for use in modelling this structure

SKA Response: For all intents and purposes of the HEC-RAS modelling parameters, this is not considered an "abrupt" reduction. Per Appendix B of the HEC-RAS User Manual, a detailed study has been conducted to determine the sensitivity of the expansion and contraction coefficients on the flow regime. Detailed calculations are provided within this appendix that may be used to confirm the appropriate coefficient to use outside of the tables provided in the text. Using these calculations and recommendation, it was determined that the expansions coefficient is 0.32 and the contraction coefficient should fall between the range of 0.3-0.5. Therefore, the provided expansion and contraction coefficients of 0.5 and 0.3 (respectively) are appropriate.

Per Appendix B of the HEC-RAS User Manual, the expansion coefficient should be calculated as follows:

$$C_e = -0.09 + 0.570\left(\frac{D_{ob}}{D_c}\right) + 0.075\left(\frac{F_{c2}}{F_{c1}}\right)$$ (refer to page B-10 of the manual)

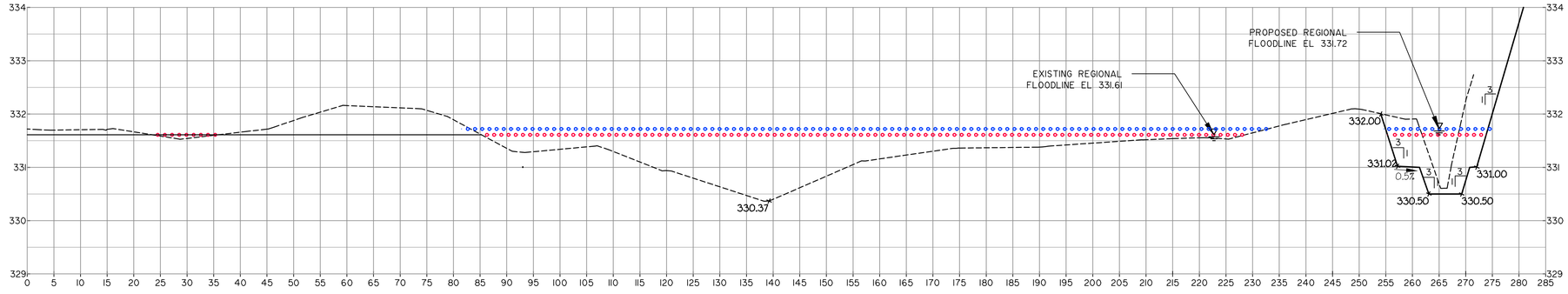
where:

A_{left}	6.41
A_{right}	15.78
A_c	23.29
T	48.68
Tc	18
D_{ob}	0.723272
D_c	1.293889
F_{c1}	0.39
F_{c2}	0.47

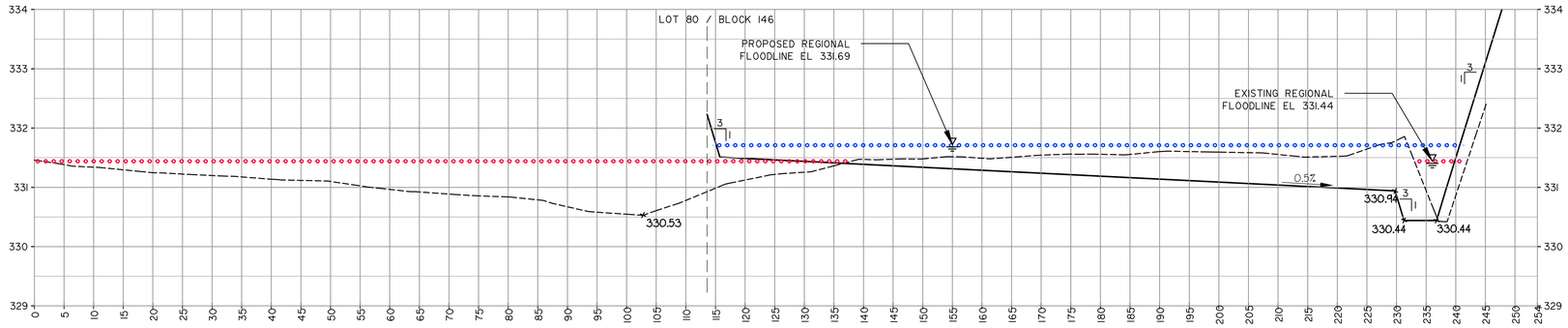
Therefore:

C_e	**0.31901**

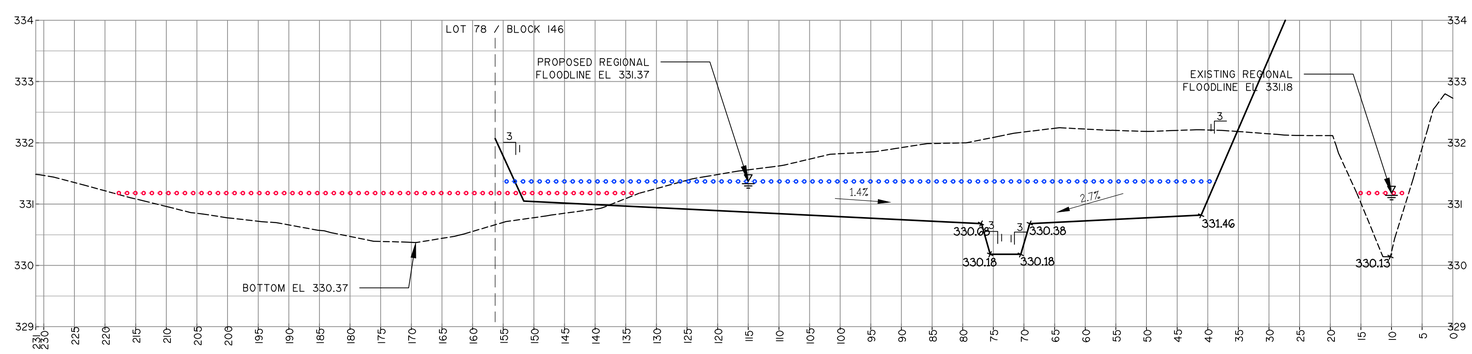
SECTION 3108.50



SECTION 3108.30



SECTION 3108.25



LEGEND

- PROPOSED GROUND
- PROPOSED REGIONAL FLOODLINE
- EXISTING GROUND
- EXISTING REGIONAL FLOODLINE

SCALE HOR. 1:500
VER. 1:50

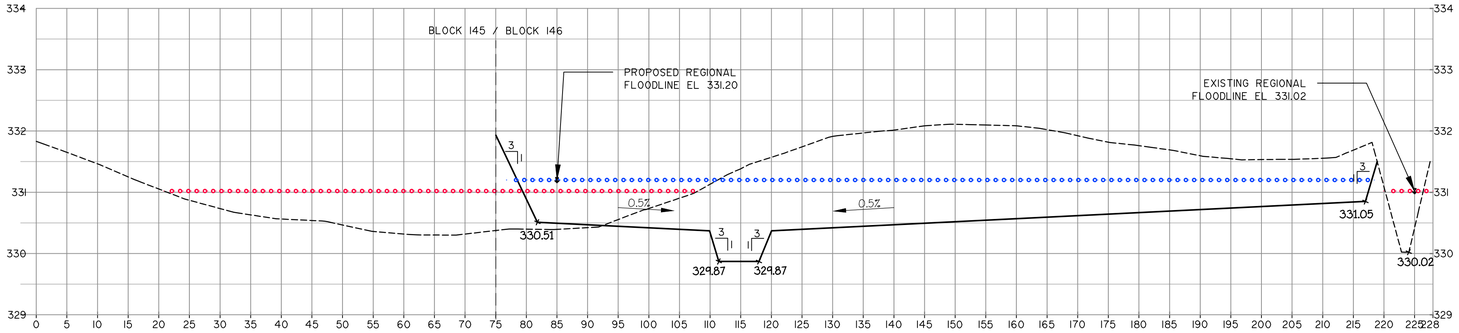
FARSIGHT HOMES
CUT/FILL CROSS SECTIONS

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

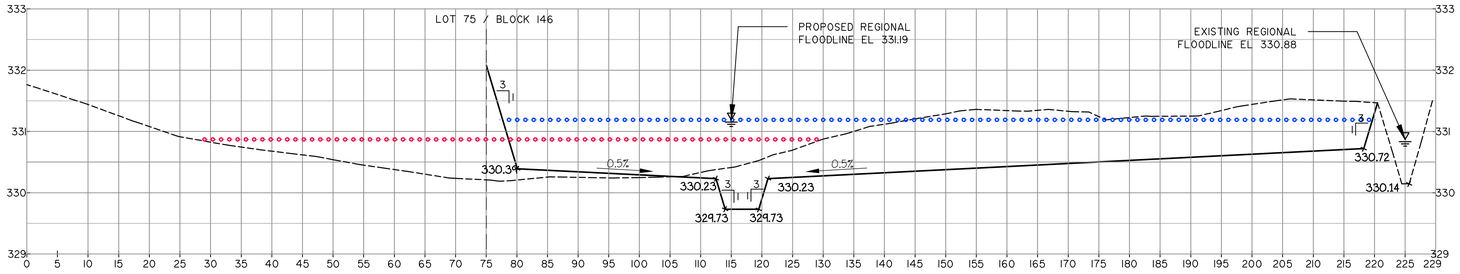
PROJECT NUMBER	FIGURE NUMBER
13:286	CF-1

PLOT DATE: 4/22/2022 9:05 AM CAD FILE: P:\13\286\Drawing Files\Phase 1\Figures\13_286 F&SR submission.dwg Fig 13.15 Floodplain Storage 13dSubmission1.dwg

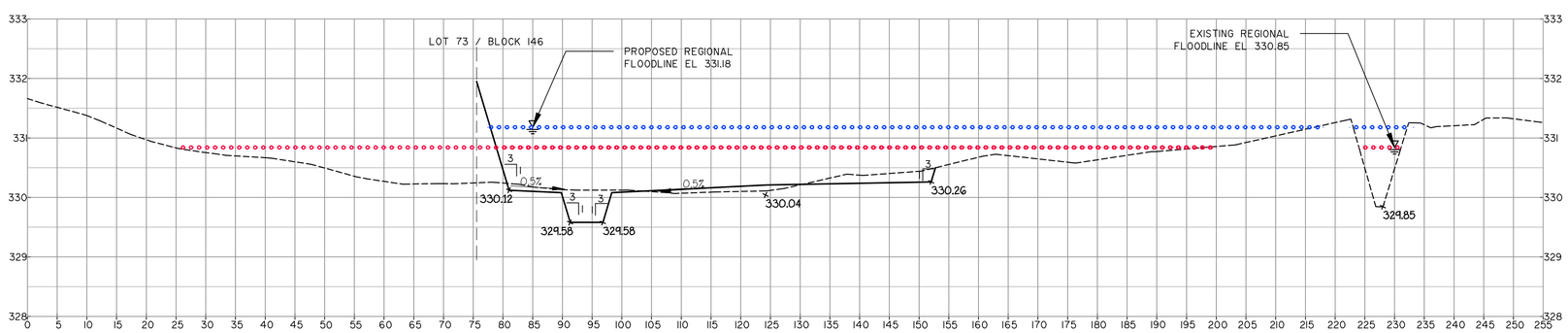
SECTION 3108.00



SECTION 3107.75



SECTION 3107.50



LEGEND

- PROPOSED GROUND
- PROPOSED REGIONAL FLOODLINE
- EXISTING GROUND
- EXISTING REGIONAL FLOODLINE

SCALE HOR. 1:500
VER. 1:50

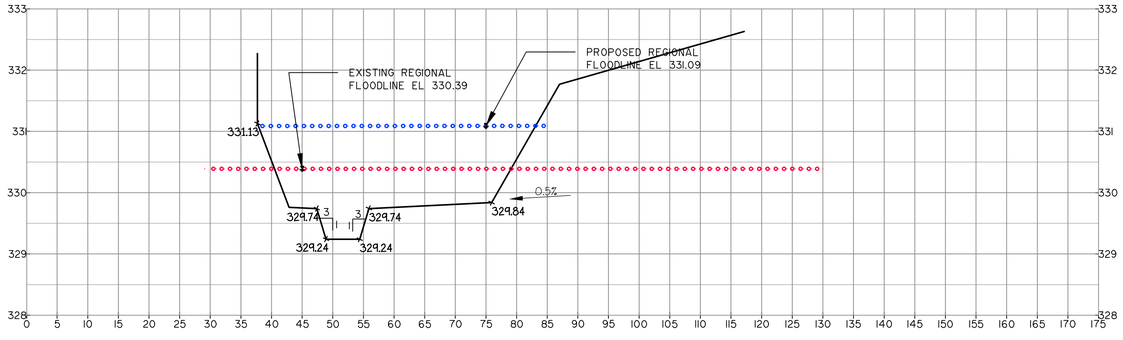
FARSIGHT HOMES
CUT/FILL CROSS SECTIONS

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

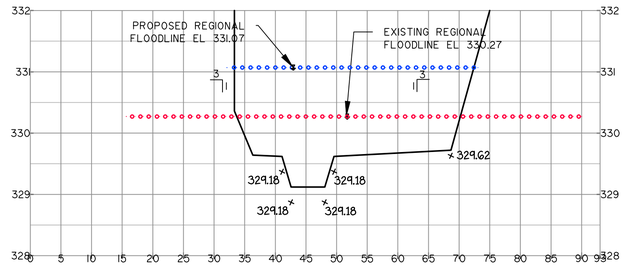
PROJECT NUMBER	FIGURE NUMBER
13:286	CF-2

PLOT DATE: 1/20/2022 2:32 AM CAD FILE: P:\13\286\Drawing Files\Phase 1\Figure\3- 3rd FSR submission\286 Fig 13.15 Floodplain Storage (3rdSubmission).dwg

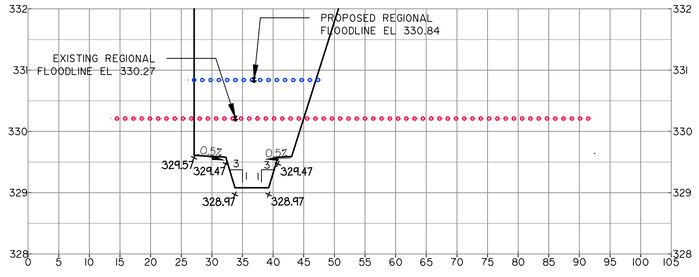
SECTION 3107.40



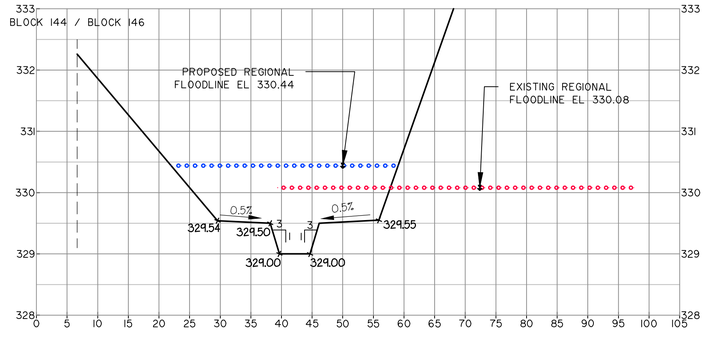
SECTION 3107.30



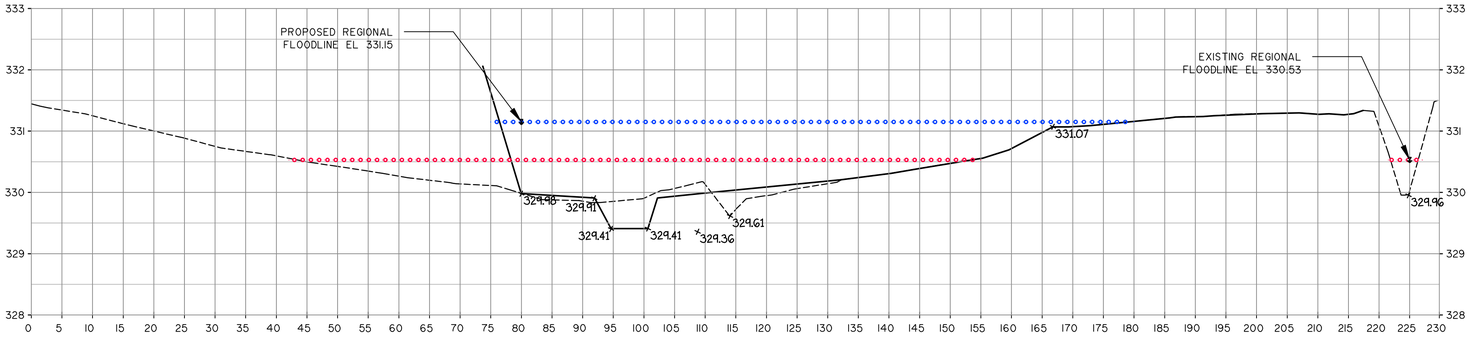
SECTION 3107.20



SECTION 3107.00



SECTION 3107.45



SCALE HOR. 1:500
VER. 1:50

LEGEND

- PROPOSED GROUND
- PROPOSED REGIONAL FLOODLINE
- EXISTING GROUND
- EXISTING REGIONAL FLOODLINE

FARSIGHT HOMES
CUT/FILL CROSS SECTIONS

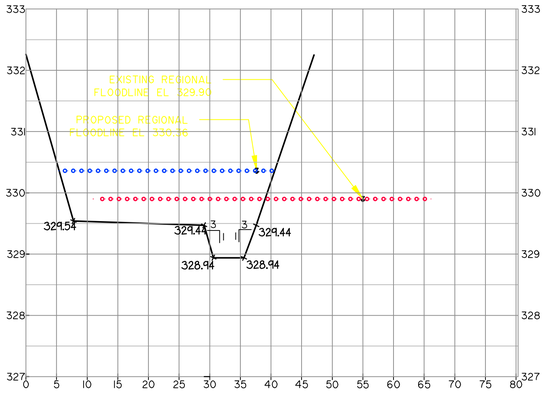
SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER **13:286**

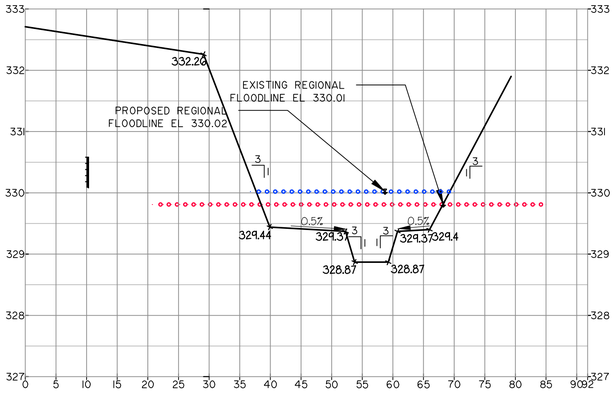
FIGURE NUMBER **CF-3**

PLOT DATE: 1/23/2023 9:38 AM CAD FILE: P:\13\286\Drawing Files\Phase II\Figures\3- 3rd FSR submission\286 Fig 13-15 Floodplain Storage 1stSubmission.dwg

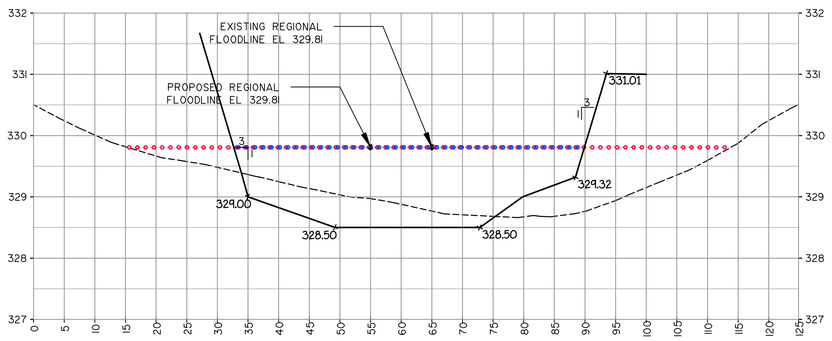
SECTION 3106.75



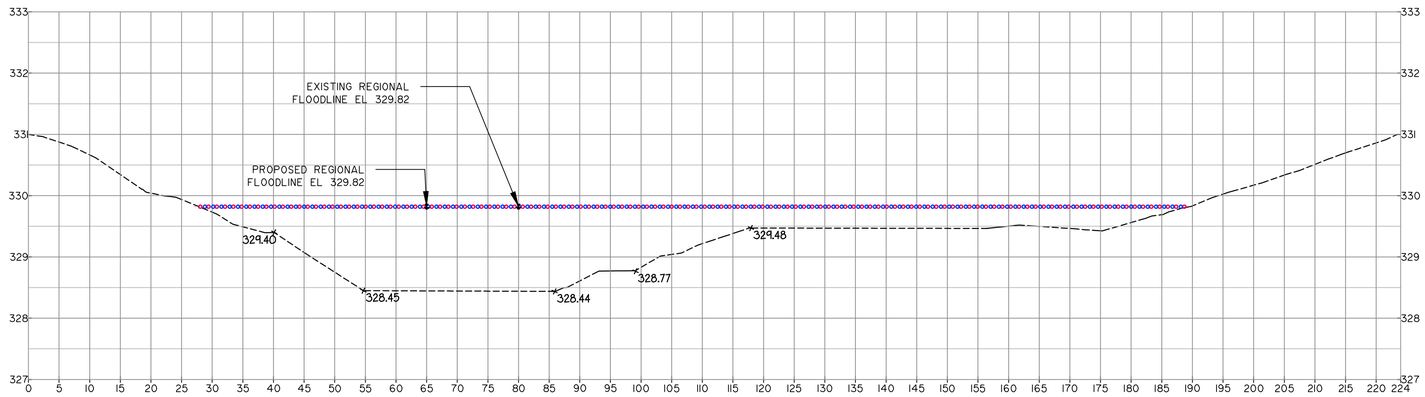
SECTION 3106.50



SECTION 3106.40



SECTION 3106.00



LEGEND

- PROPOSED GROUND
- PROPOSED REGIONAL FLOODLINE
- EXISTING GROUND
- EXISTING REGIONAL FLOODLINE

SCALE HOR. 1:500
VER. 1:50

FARSIGHT HOMES
CUT/FILL CROSS SECTIONS

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	CF-4

PLOT DATE: 6/23/2022 9:45 AM CAD FILE: P:\13\286\Drawing Files\Plans (V)\Figures\13- 3rd ESR submission\286 Fig 13-5 Floodplain Storage (Updated)submission).dwg

APPENDIX F

OGS CALCULATIONS

Hydroworks Sizing Summary

Farsight
Stouffville, Ontario

04-06-2021

Recommended Size: HS 8

A HydroStorm HS 8 is recommended to provide 80 % annual TSS removal based on a drainage area of 2.05 (ha) with an imperviousness of 60 % and Toronto Central, Ontario rainfall for the City of Toronto particle size distribution.

The recommended HydroStorm HS 8 treats 99 % of the annual runoff and provides 80 % annual TSS removal for the Toronto Central rainfall records and City of Toronto particle size distribution.

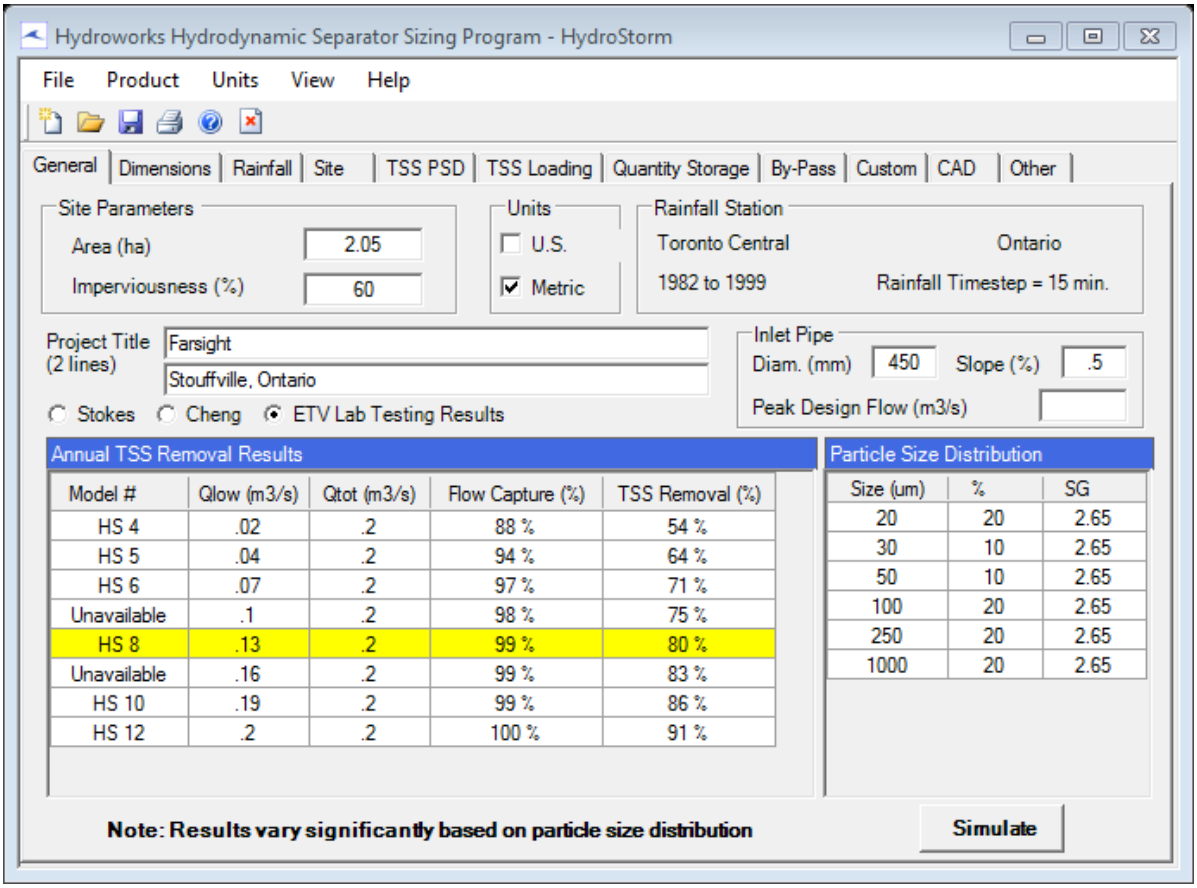
The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .2 (m3/s) for the given 450 (mm) pipe diameter at .5% slope. The headloss was calculated to be 85 (mm) based on a flow depth of 450 (mm) (full pipe flow).

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

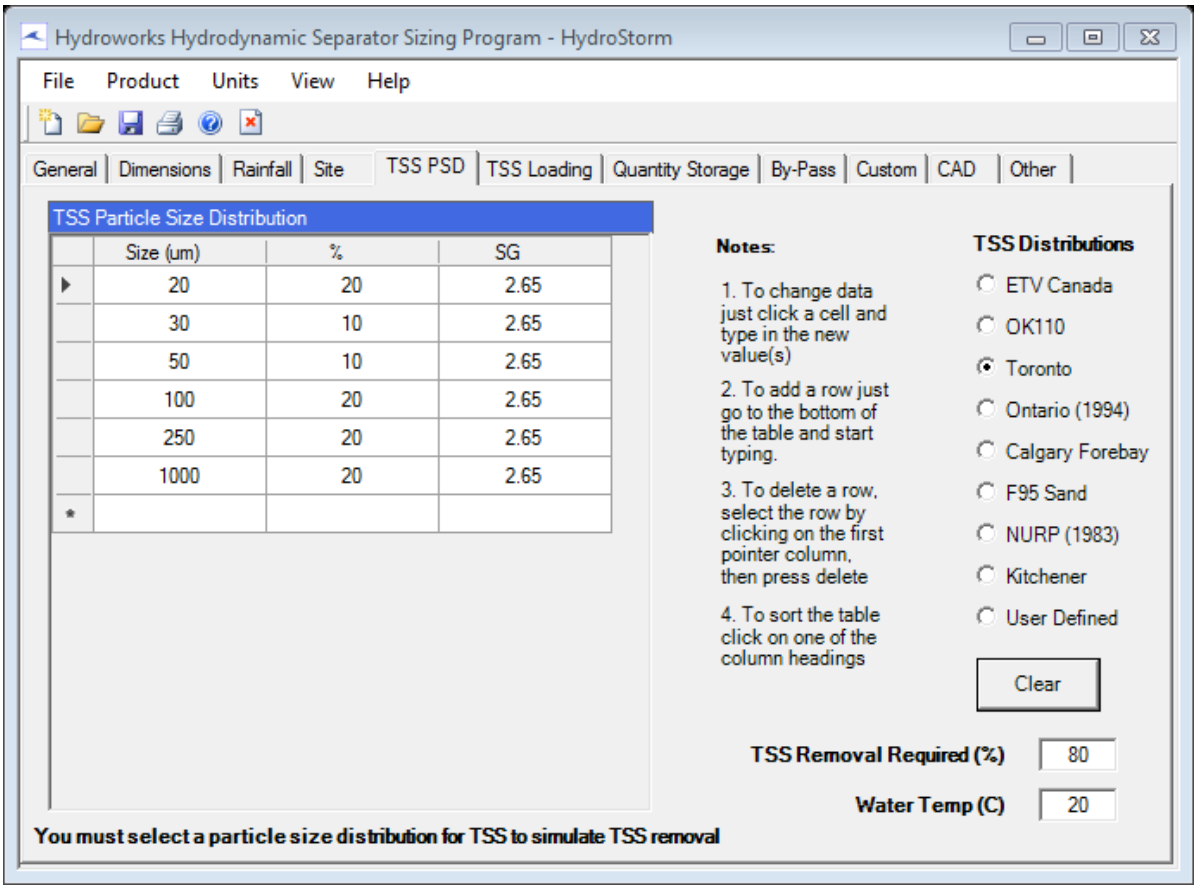
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroStorm . Design liability is only valid for lawsuits brought within the United States where Hydroworks has its corporate headquarters.

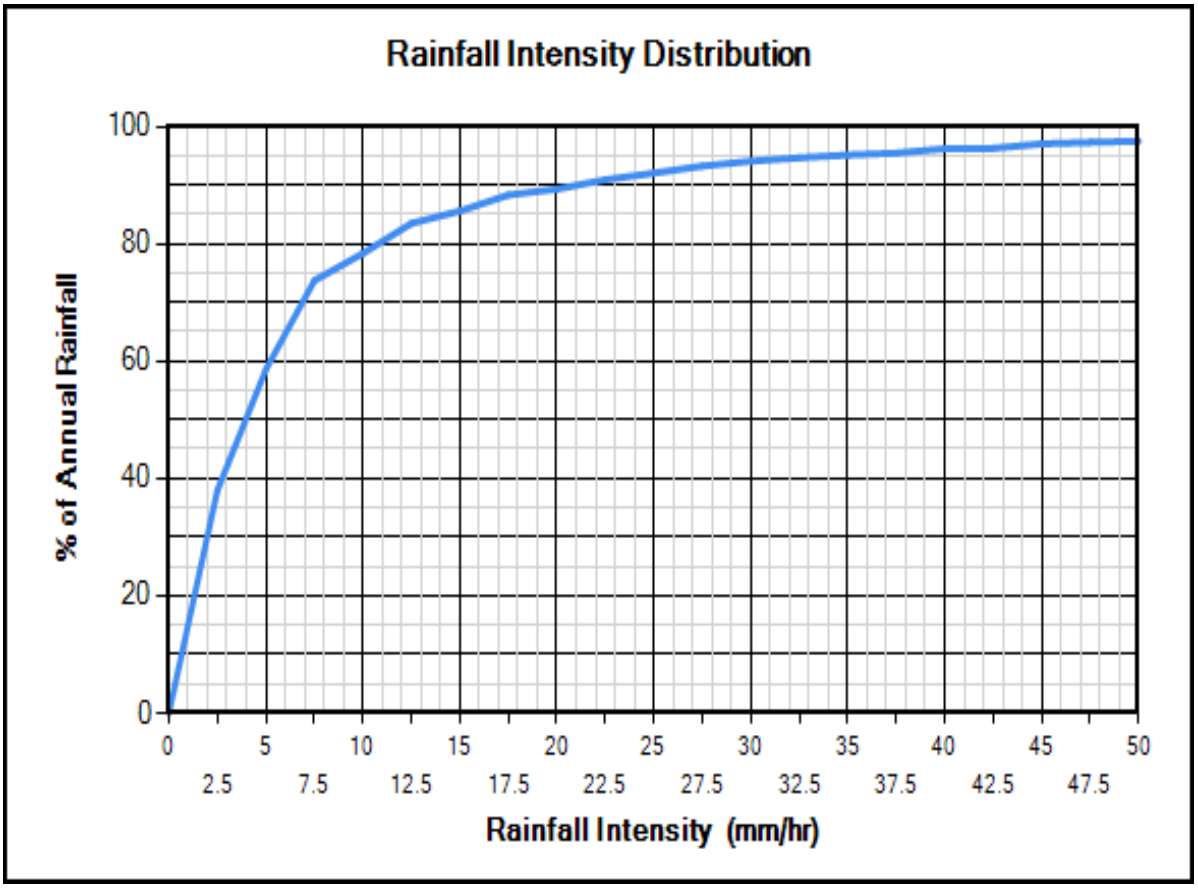
TSS Removal Sizing Summary



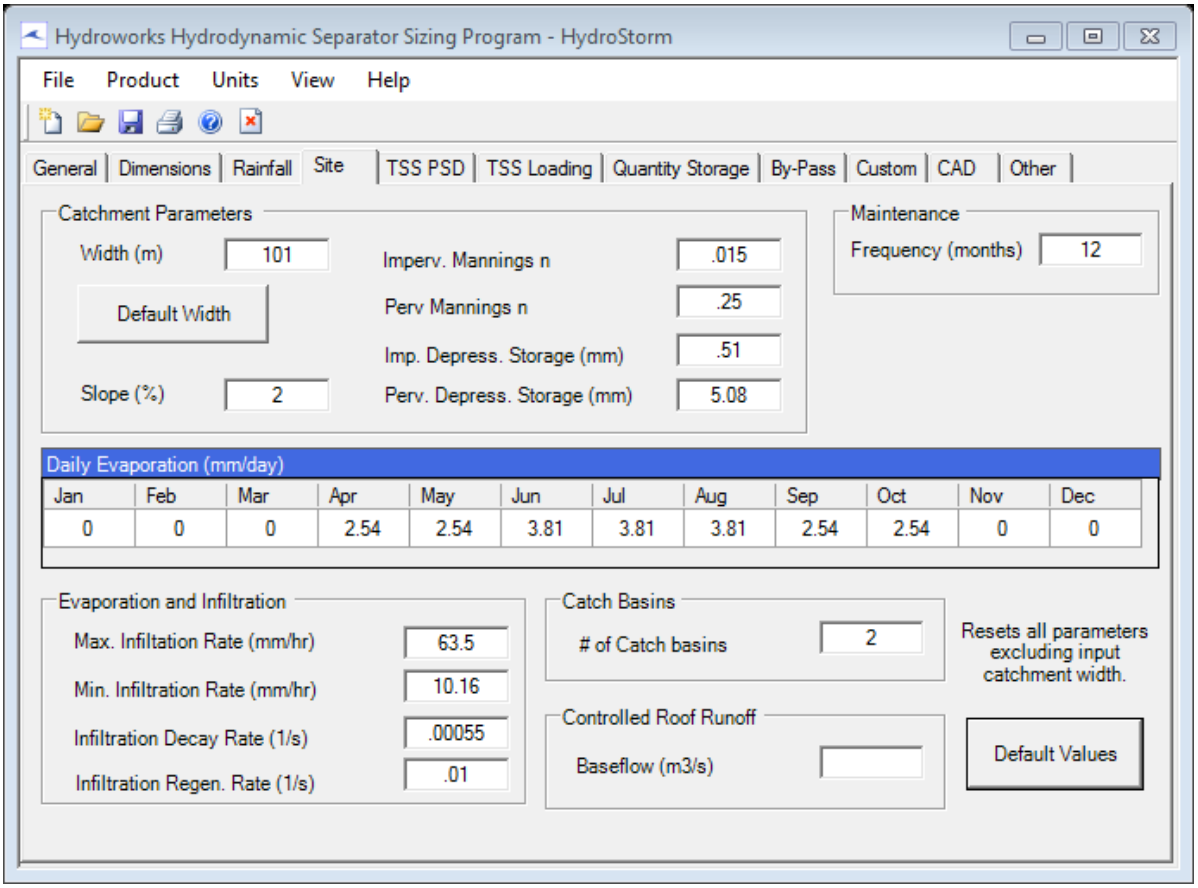
TSS Particle Size Distribution



Rainfall Station - Toronto Central, Ontario(1982 to 1999)



Site Physical Characteristics



Dimensions And Capacities

Hydroworks Hydrodynamic Separator Sizing Program - HydroStorm

File Product Units View Help

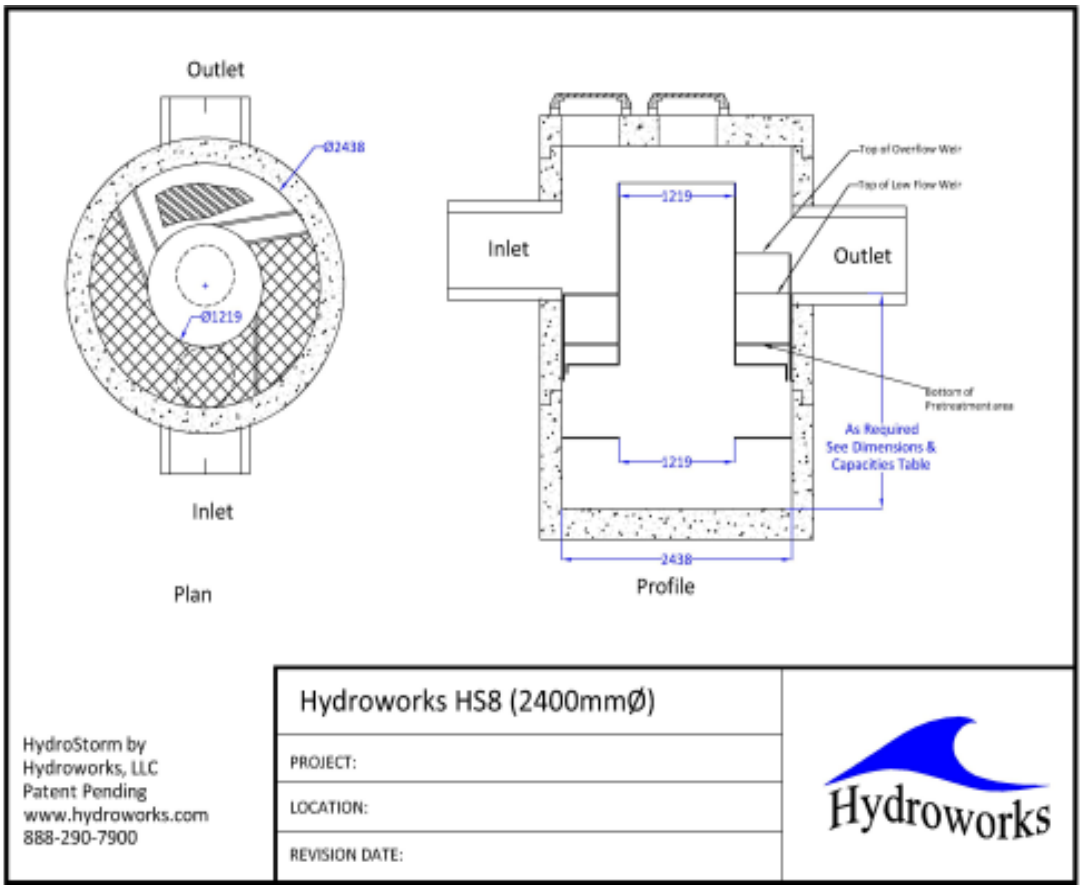
General | Dimensions | Rainfall | Site | TSS PSD | TSS Loading | Quantity Storage | By-Pass | Custom | CAD | Other

Dimensions and Capacities

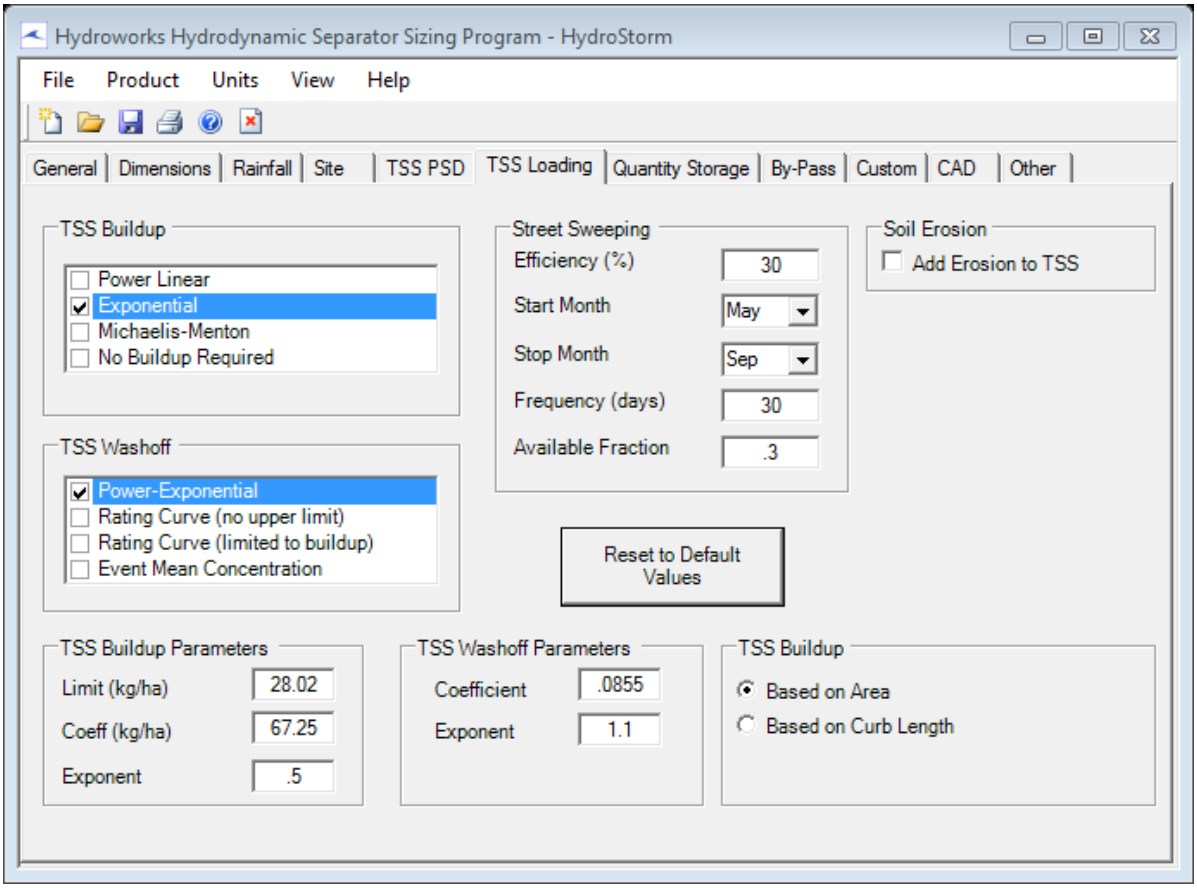
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	642	1.8	2.8
HS 6	1.83	1.83	1041	3.2	4.8
Unavailable	2.13	1.98	1576	4.6	7.1
HS 8	2.44	2.4	2354	7.5	11.2
Unavailable	2.74	2.44	3243	9.3	14.4
HS 10	3.05	2.74	4328	13.1	20
HS 12	3.66	3.35	7166	23.7	35.2

Depth = Depth from outlet invert to inside bottom of tank

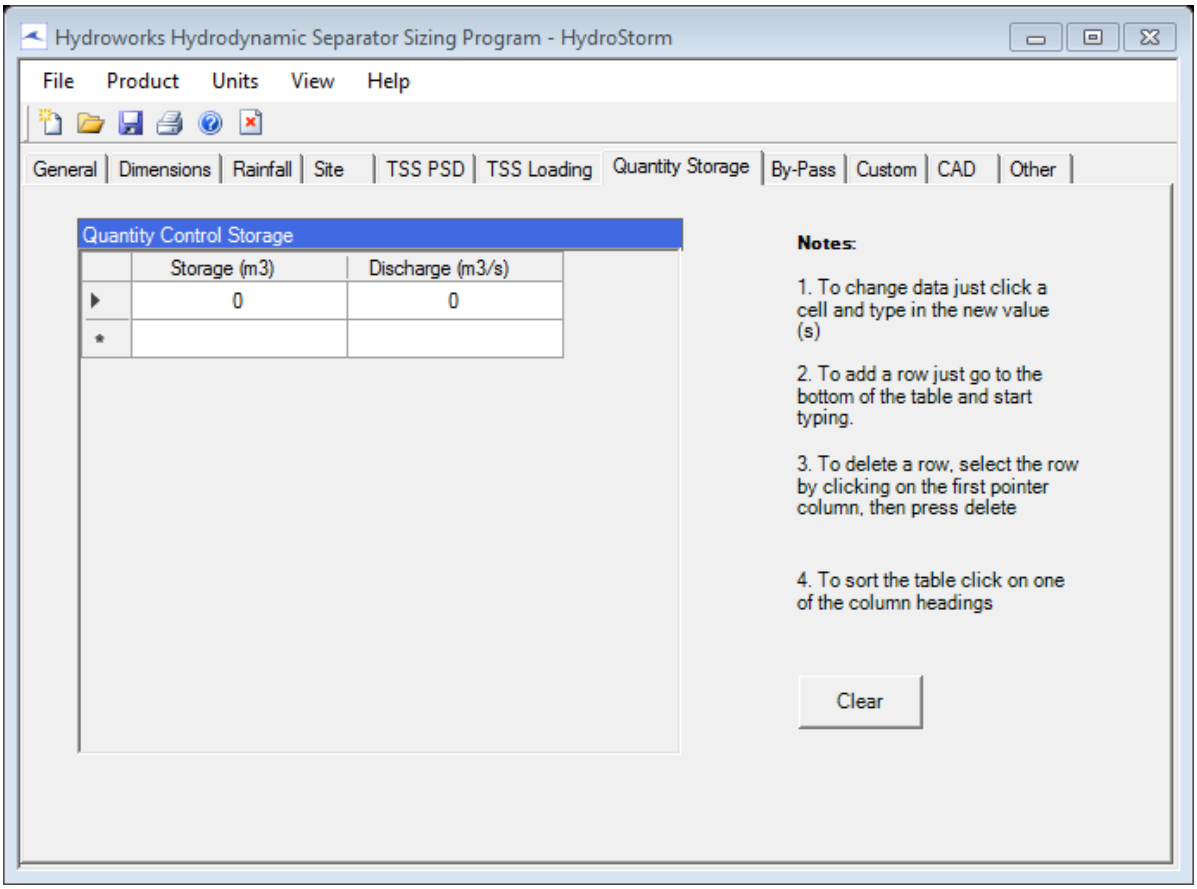
Generic HS 8 CAD Drawing



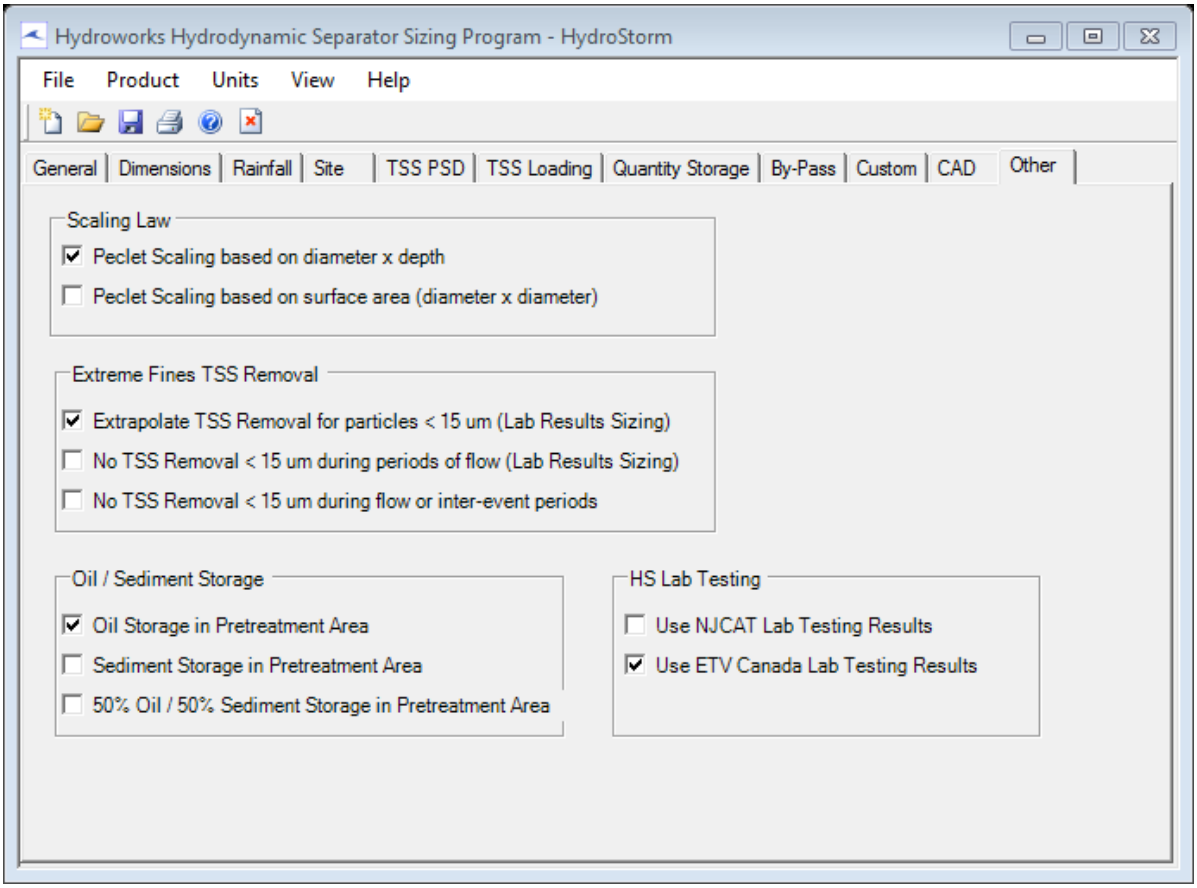
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Hydroworks Sizing Program - Version 5.0
Copyright Hydroworks, LLC, 2020

Hydroworks Sizing Summary

Farsight-MH 12, OGS 2
Stouffville, Ontario

04-08-2021

Recommended Size: HS 6

A HydroStorm HS 6 is recommended to provide 80 % annual TSS removal based on a drainage area of .82 (ha) with an imperviousness of 60 % and Toronto Central, Ontario rainfall for the City of Toronto particle size distribution.

The recommended HydroStorm HS 6 treats 99 % of the annual runoff and provides 84 % annual TSS removal for the Toronto Central rainfall records and City of Toronto particle size distribution.

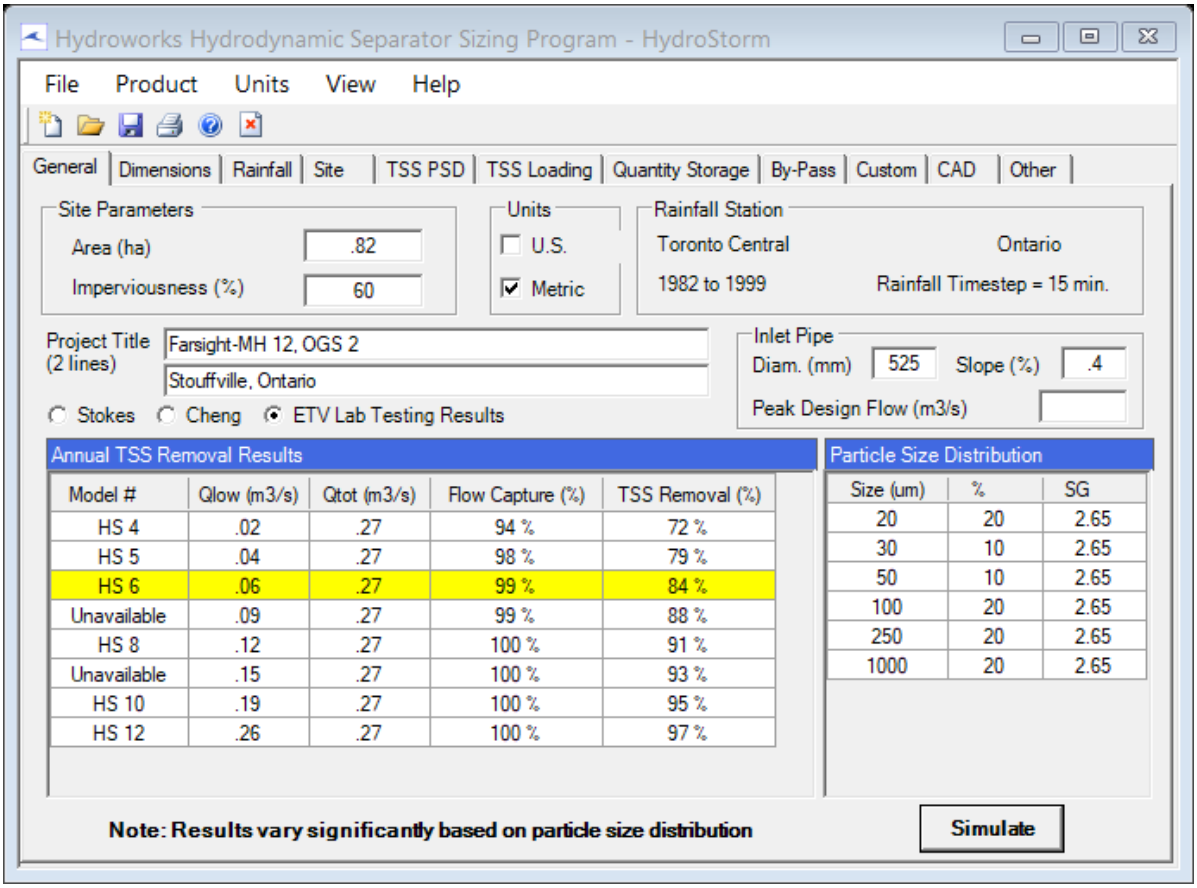
The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .27 (m3/s) for the given 525 (mm) pipe diameter at .4% slope. The headloss was calculated to be 84 (mm) based on a flow depth of 525 (mm) (full pipe flow).

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

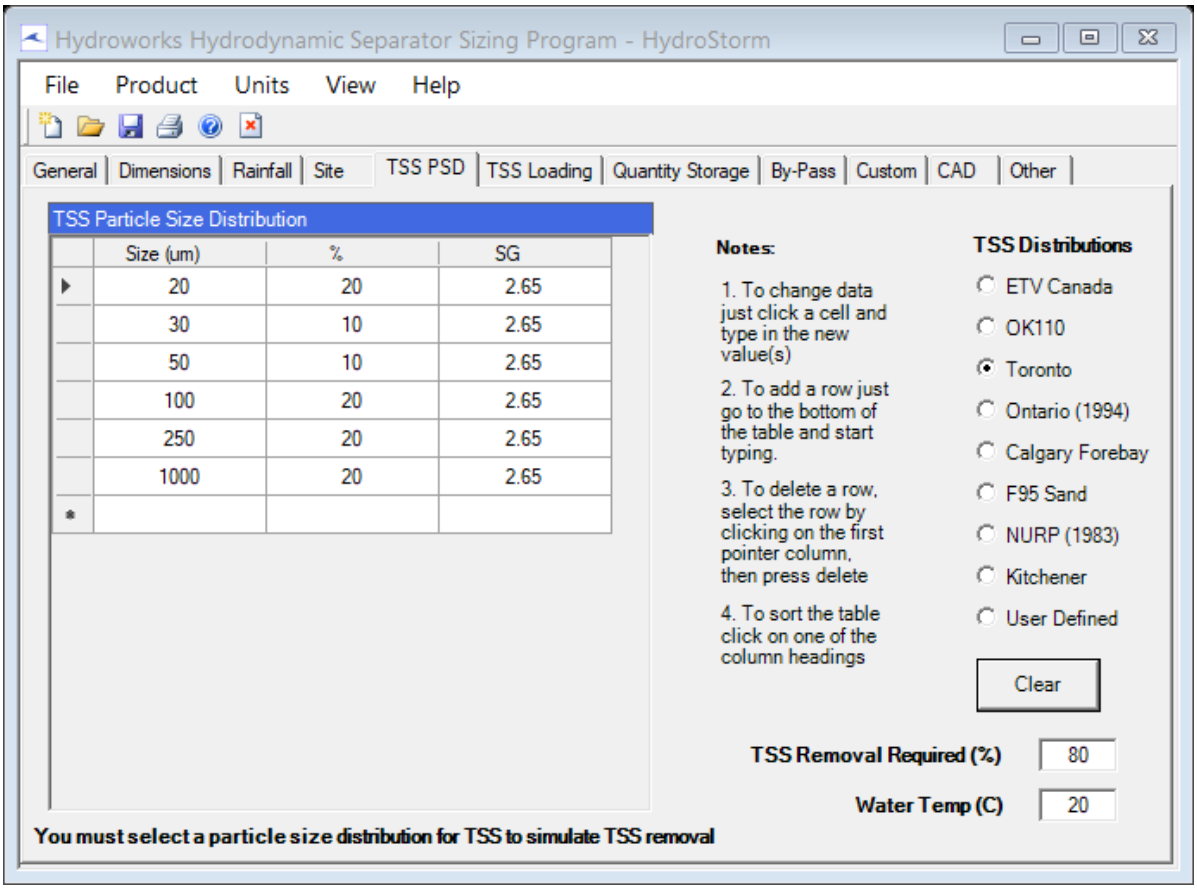
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroStorm . Design liability is only valid for lawsuits brought within the United States where Hydroworks has its corporate headquarters.

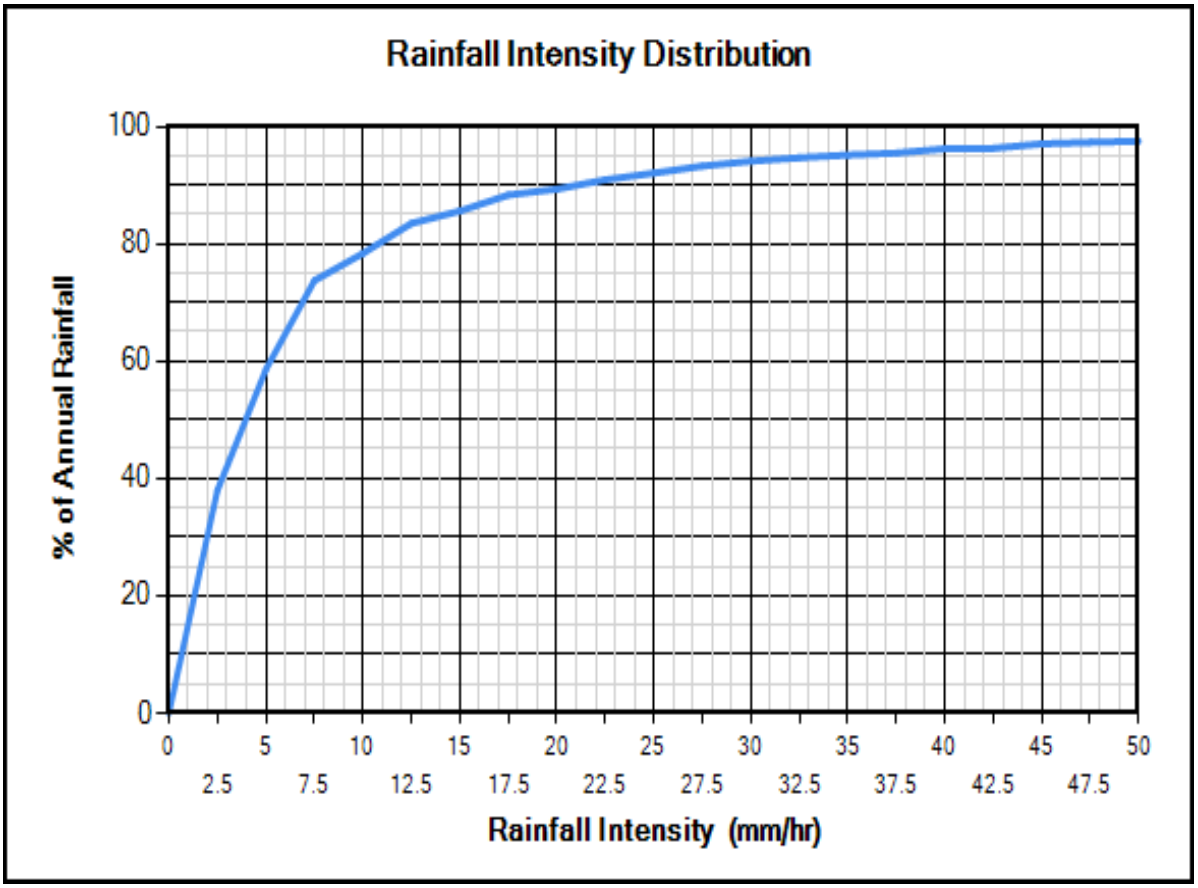
TSS Removal Sizing Summary



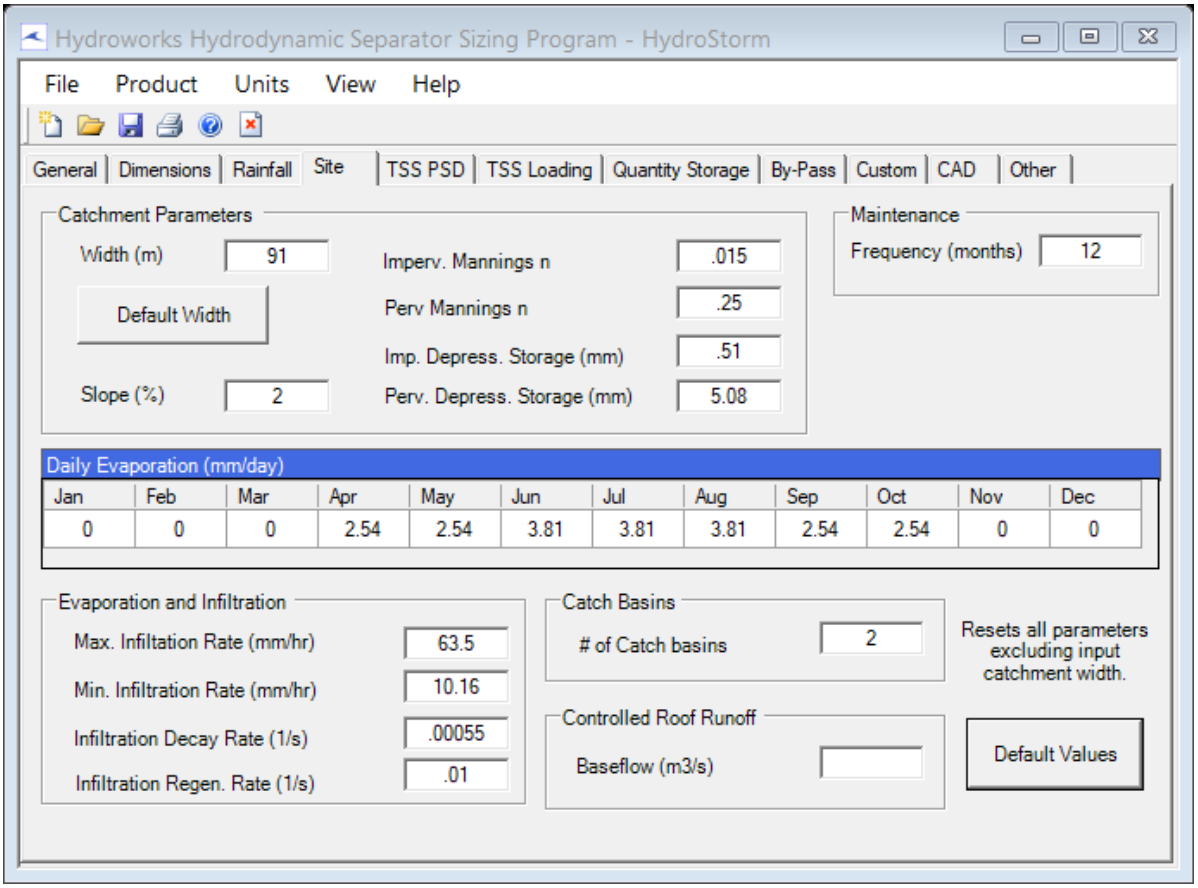
TSS Particle Size Distribution



Rainfall Station - Toronto Central, Ontario(1982 to 1999)



Site Physical Characteristics



Dimensions And Capacities

Hydroworks Hydrodynamic Separator Sizing Program - HydroStorm

File Product Units View Help

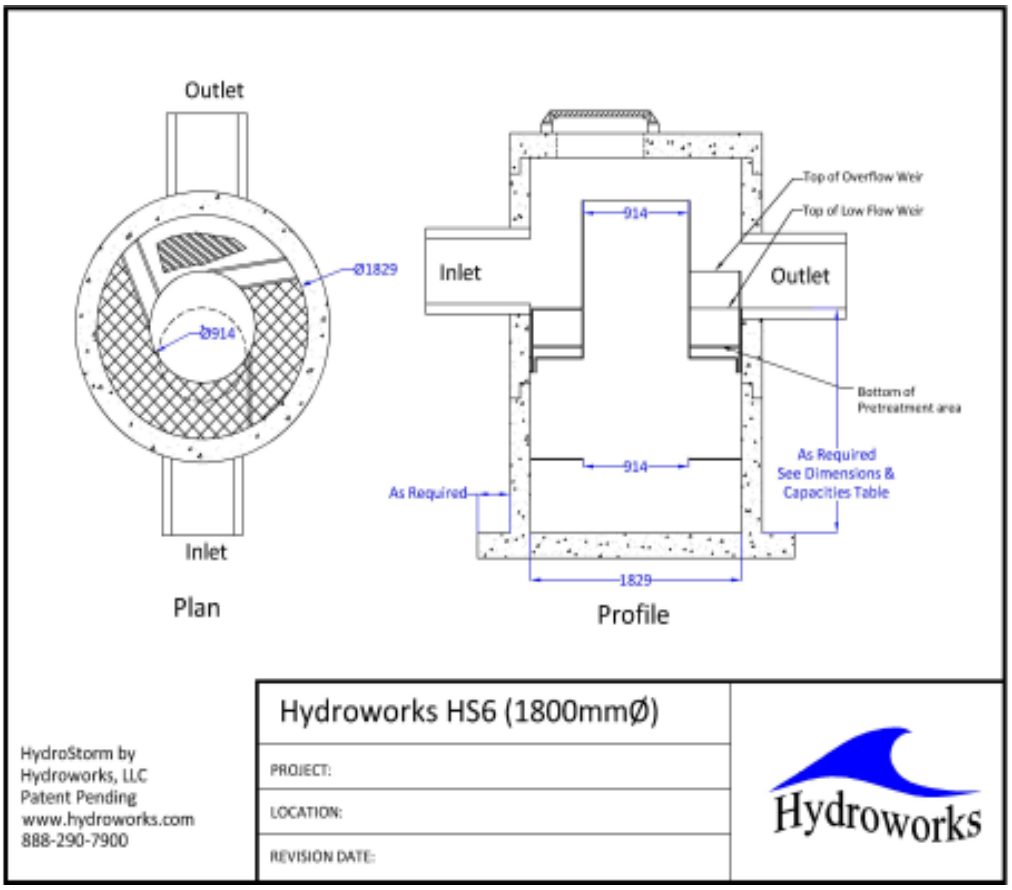
General | Dimensions | Rainfall | Site | TSS PSD | TSS Loading | Quantity Storage | By-Pass | Custom | CAD | Other

Dimensions and Capacities

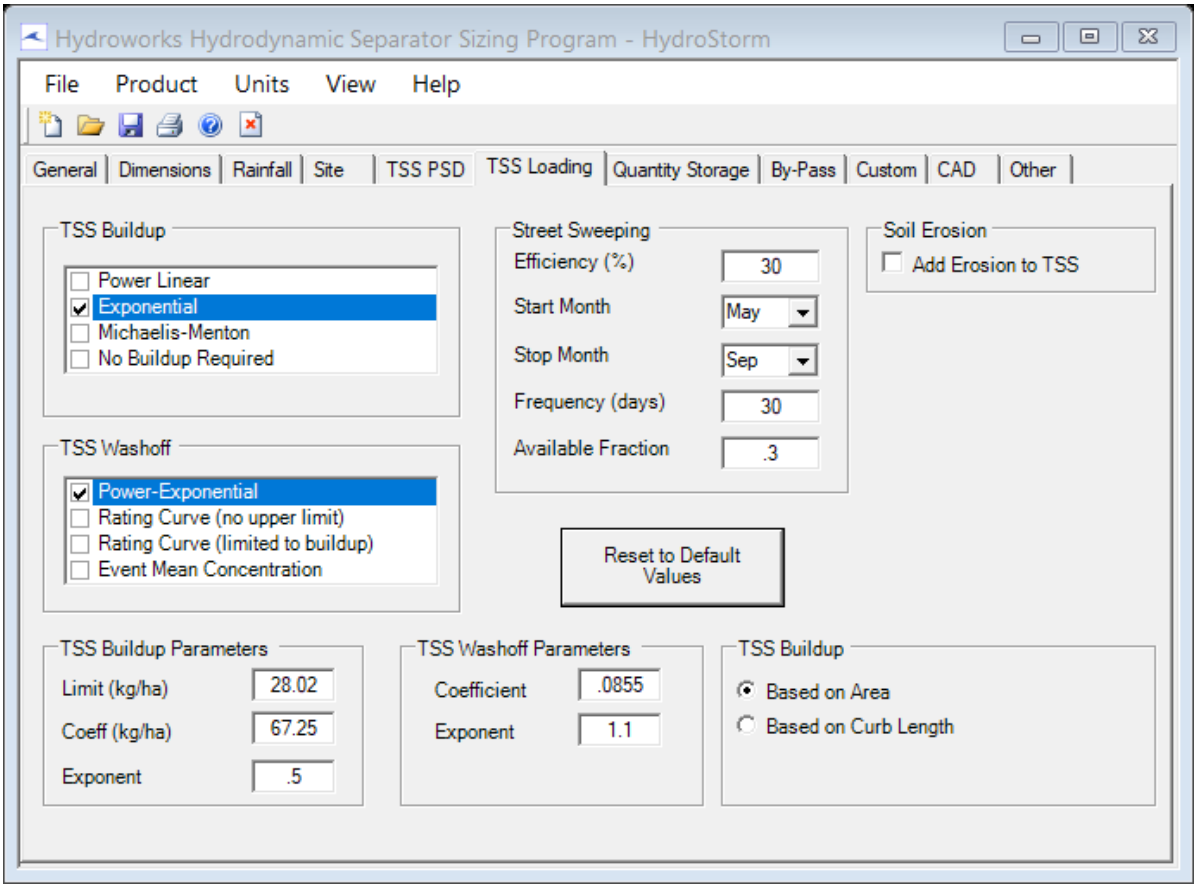
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	642	1.8	2.8
HS 6	1.83	1.83	1041	3.2	4.8
HS 7	2.13	1.98	1575	4.6	7.1
HS 8	2.44	2.13	2354	6.3	10
HS 9	2.74	2.44	3242	9.3	14.4
HS 10	3.05	2.74	4327	13.2	20
HS 12	3.66	3.35	7164	23.8	35.2

Depth = Depth from outlet invert to inside bottom of tank

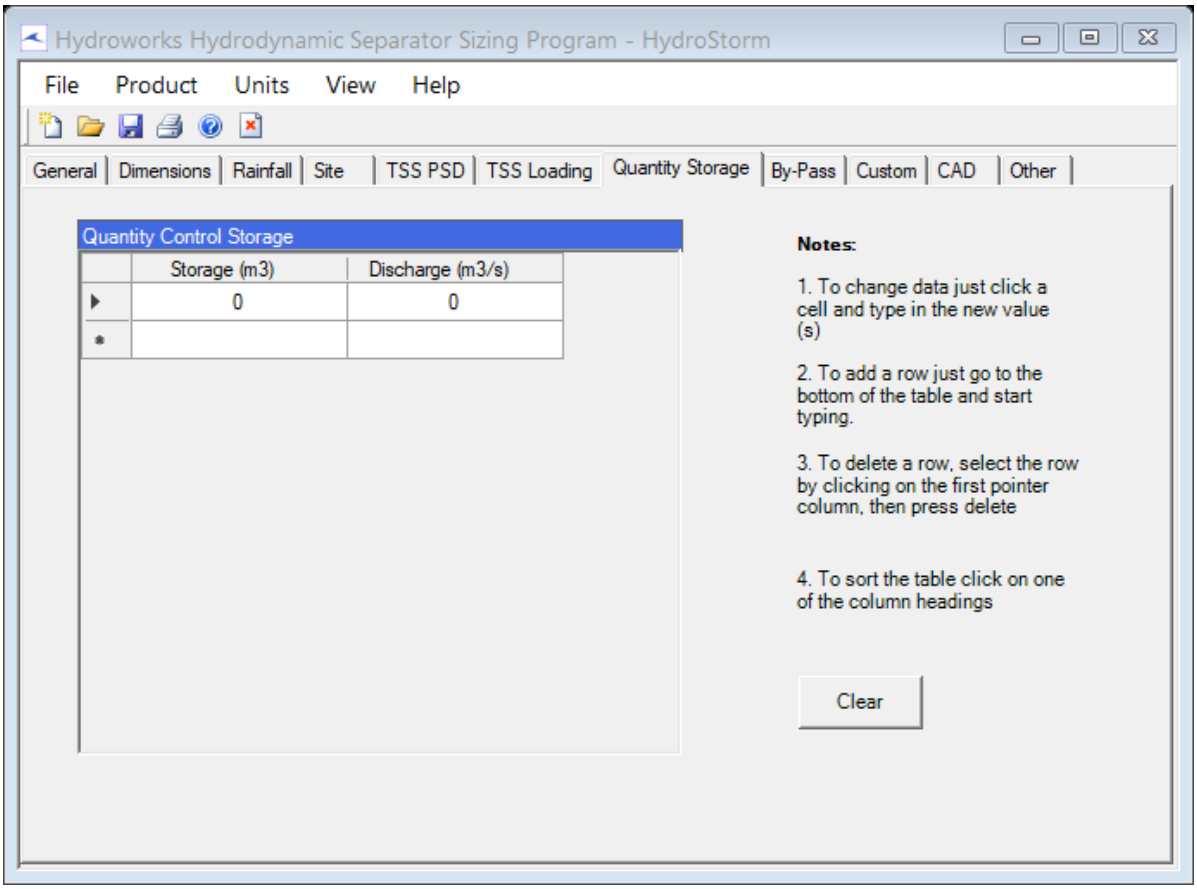
Generic HS 6 CAD Drawing



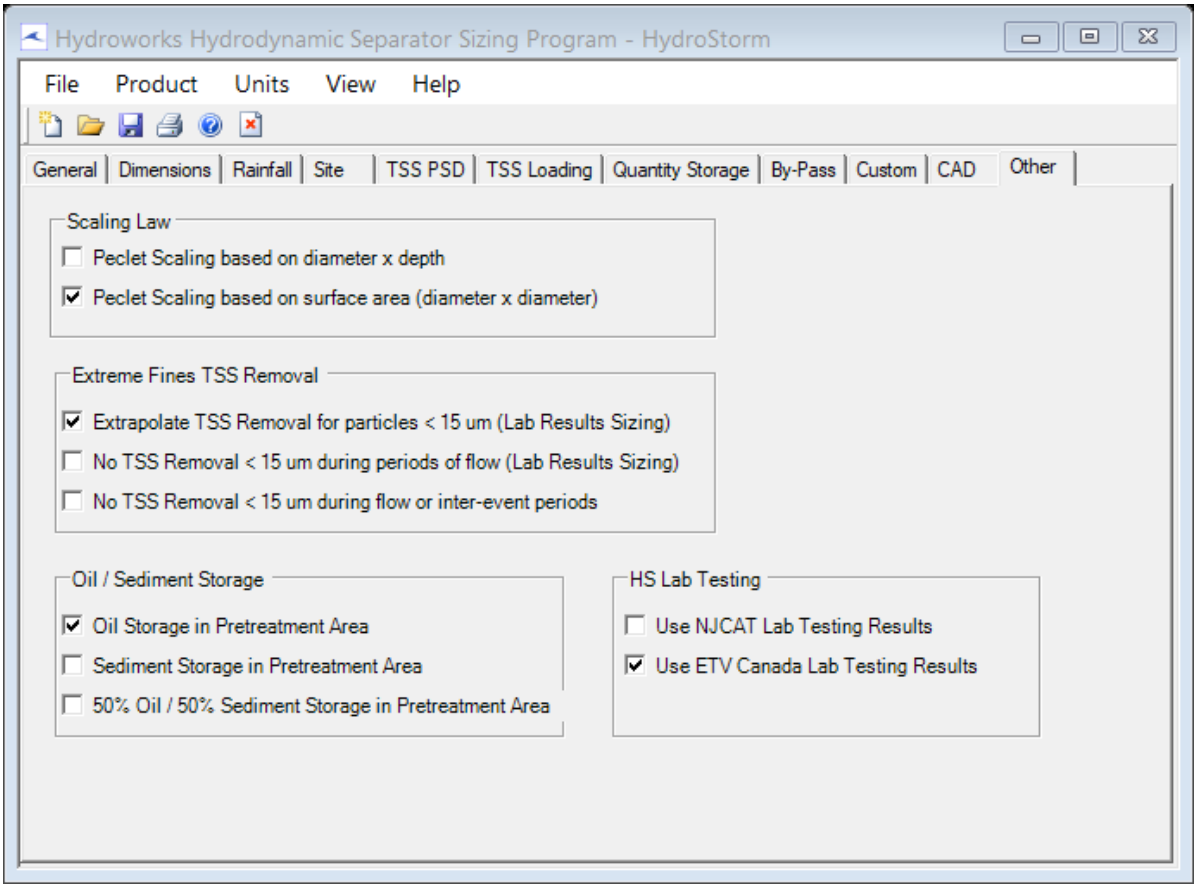
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Hydroworks Sizing Program - Version 5.0
Copyright Hydroworks, LLC, 2020

Hydroworks Sizing Summary

Farsight-MH 8, OGS 3
Stouffville, Ontario

04-08-2021

Recommended Size: HS 12

A HydroStorm HS 12 is recommended to provide 80 % annual TSS removal based on a drainage area of 4.16 (ha) with an imperviousness of 60 % and Toronto Central, Ontario rainfall for the City of Toronto particle size distribution.

The recommended HydroStorm HS 12 treats 99 % of the annual runoff and provides 84 % annual TSS removal for the Toronto Central rainfall records and City of Toronto particle size distribution.

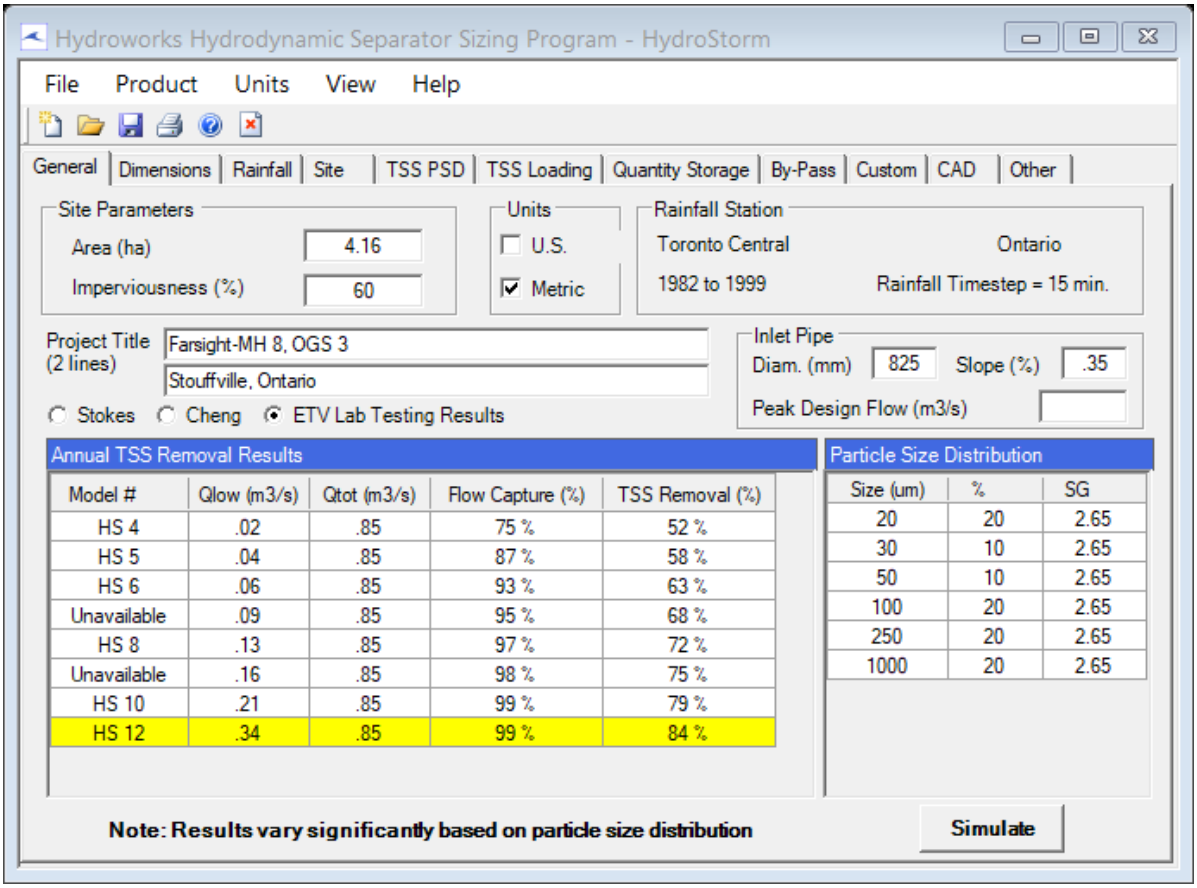
The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .85 (m3/s) for the given 825 (mm) pipe diameter at .4% slope. The headloss was calculated to be 134 (mm) based on a flow depth of 825 (mm) (full pipe flow).

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

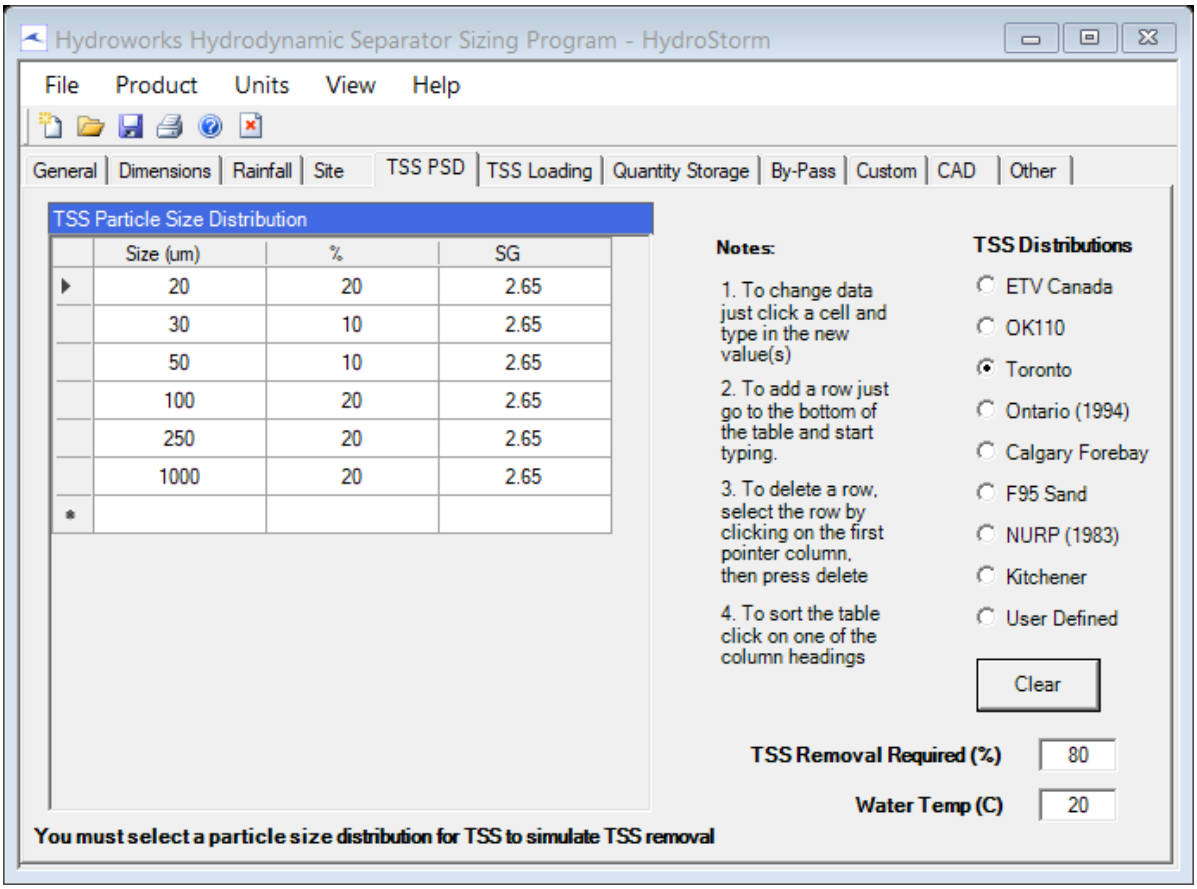
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroStorm . Design liability is only valid for lawsuits brought within the United States where Hydroworks has its corporate headquarters.

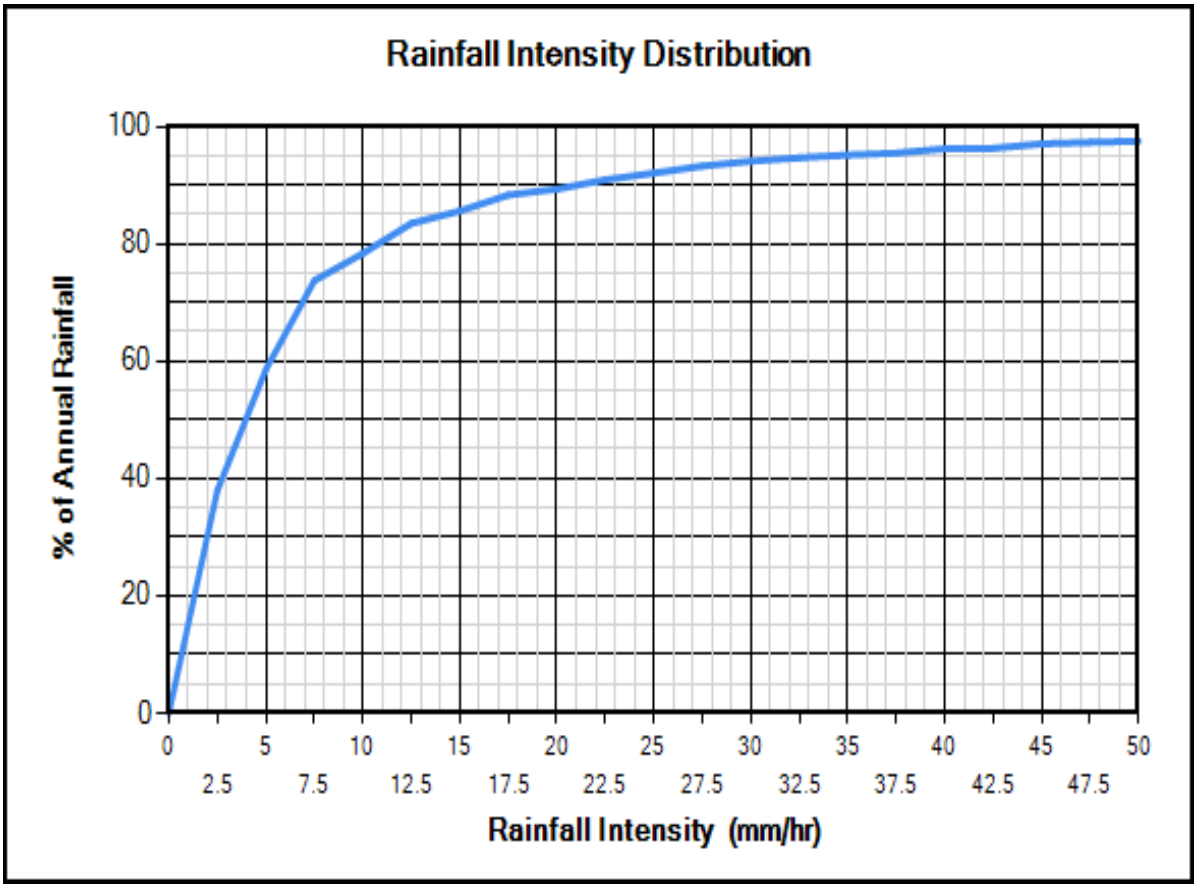
TSS Removal Sizing Summary



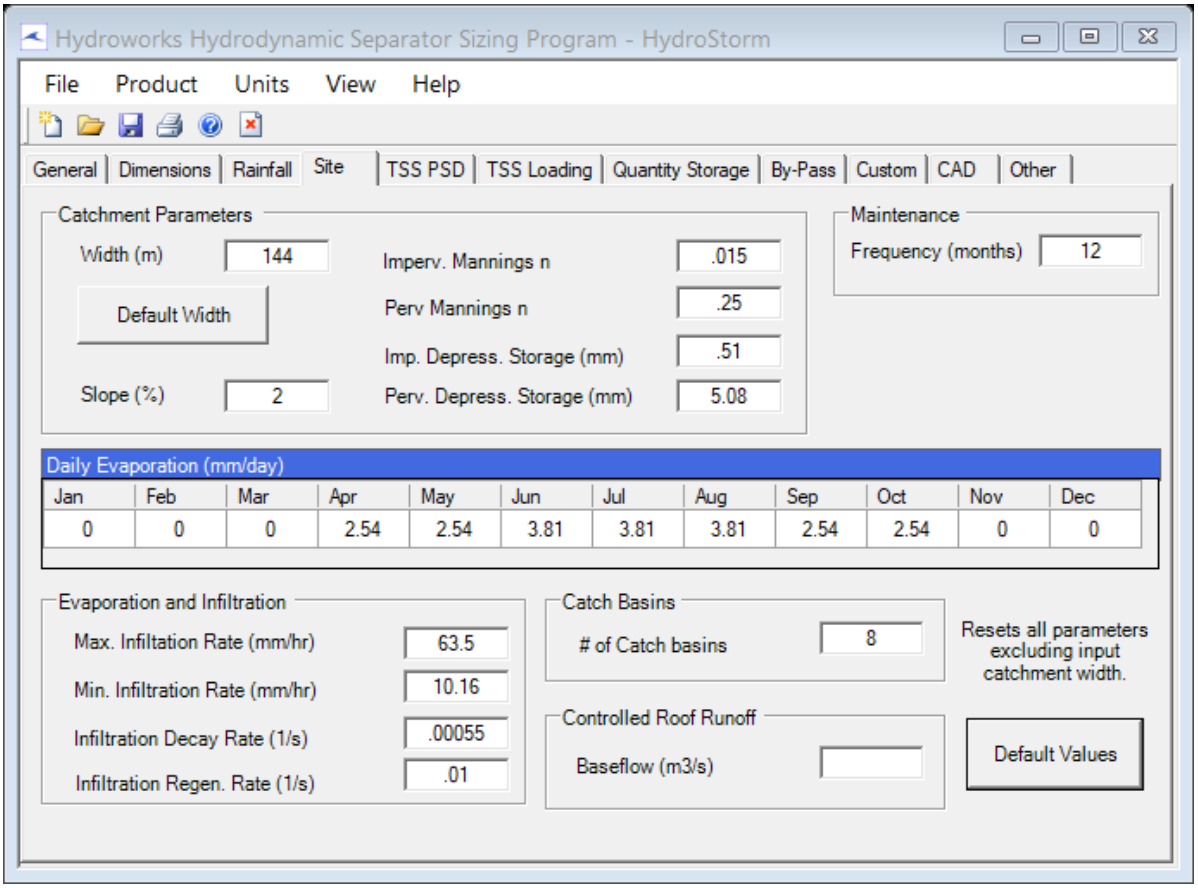
TSS Particle Size Distribution



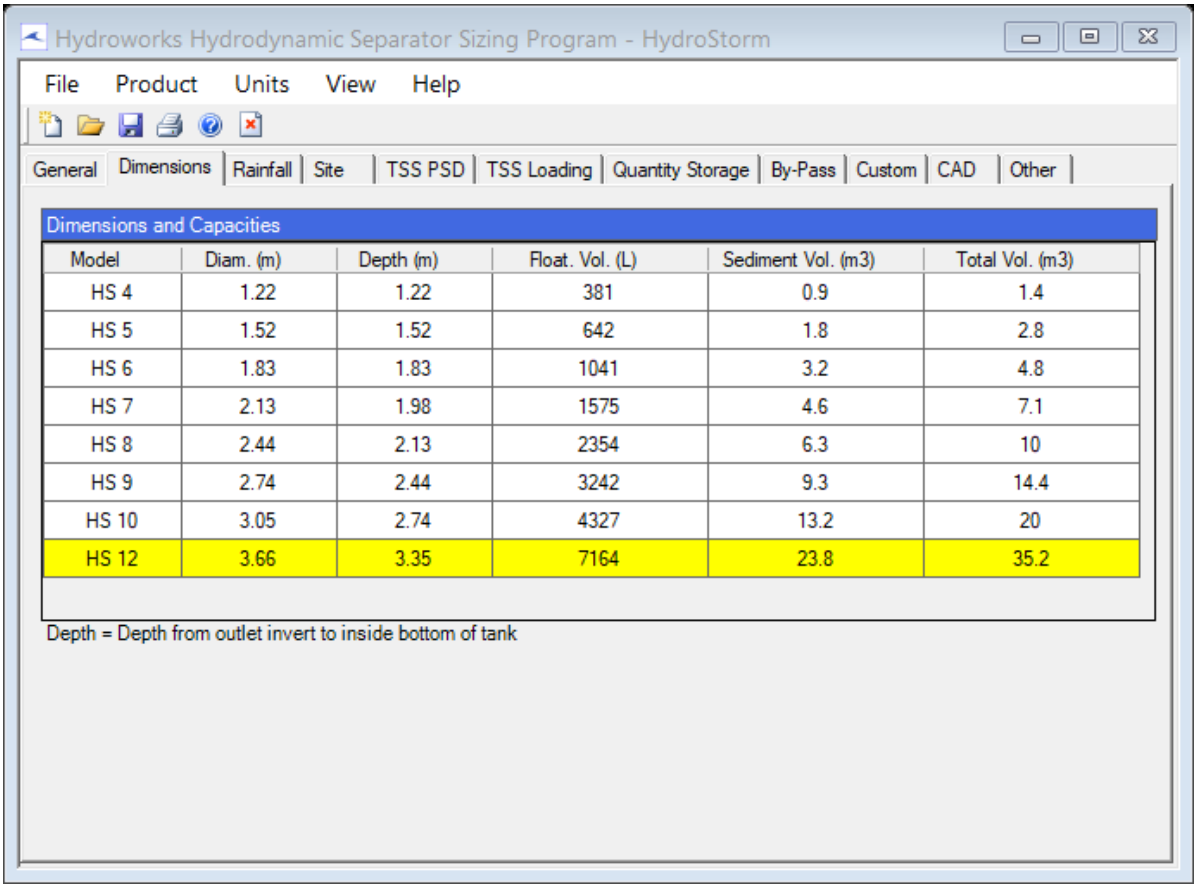
Rainfall Station - Toronto Central, Ontario(1982 to 1999)



Site Physical Characteristics



Dimensions And Capacities

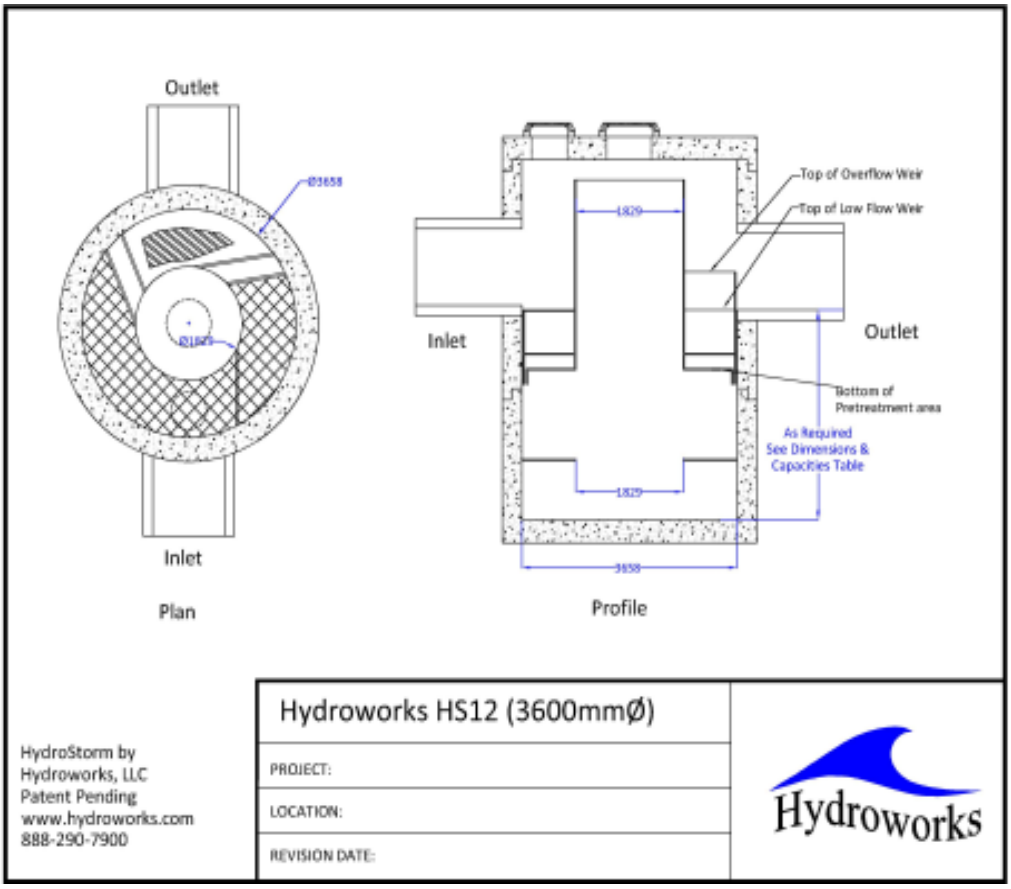


Dimensions and Capacities

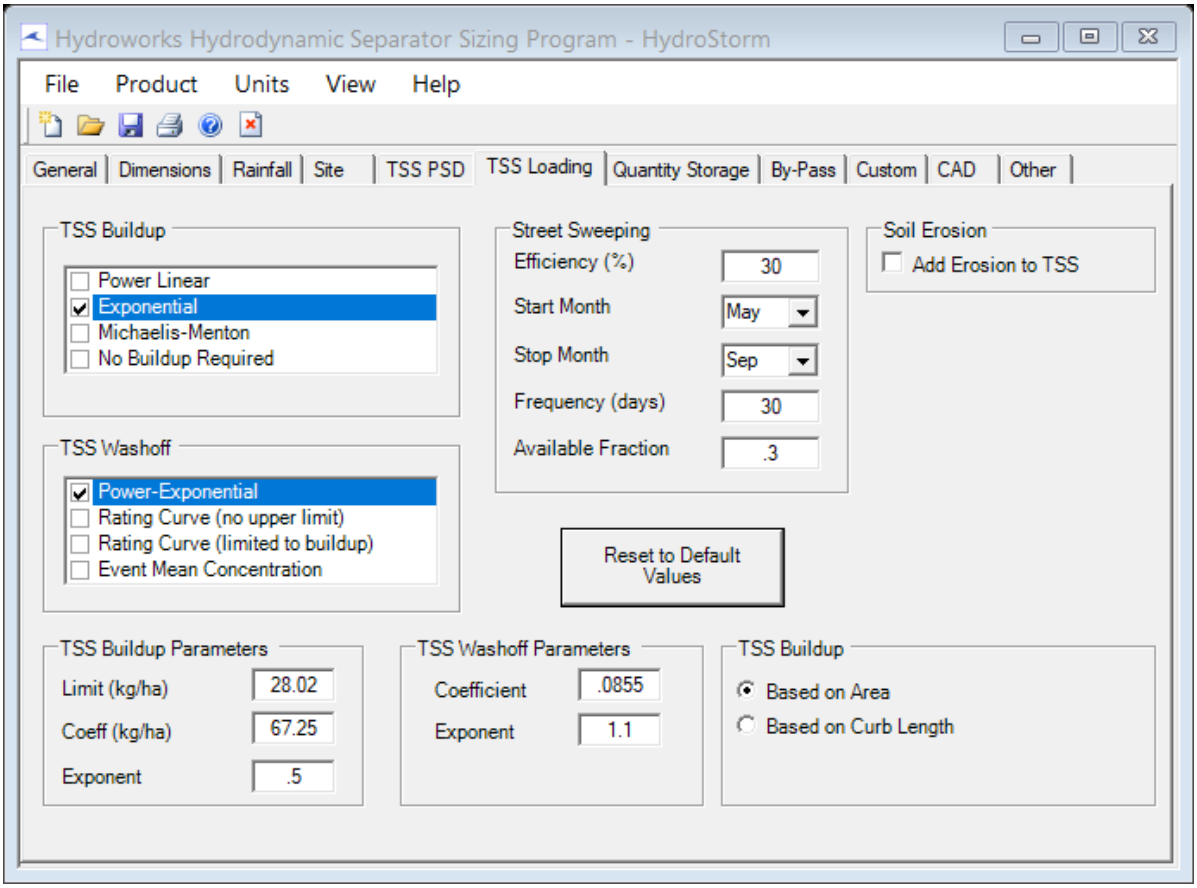
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	642	1.8	2.8
HS 6	1.83	1.83	1041	3.2	4.8
HS 7	2.13	1.98	1575	4.6	7.1
HS 8	2.44	2.13	2354	6.3	10
HS 9	2.74	2.44	3242	9.3	14.4
HS 10	3.05	2.74	4327	13.2	20
HS 12	3.66	3.35	7164	23.8	35.2

Depth = Depth from outlet invert to inside bottom of tank

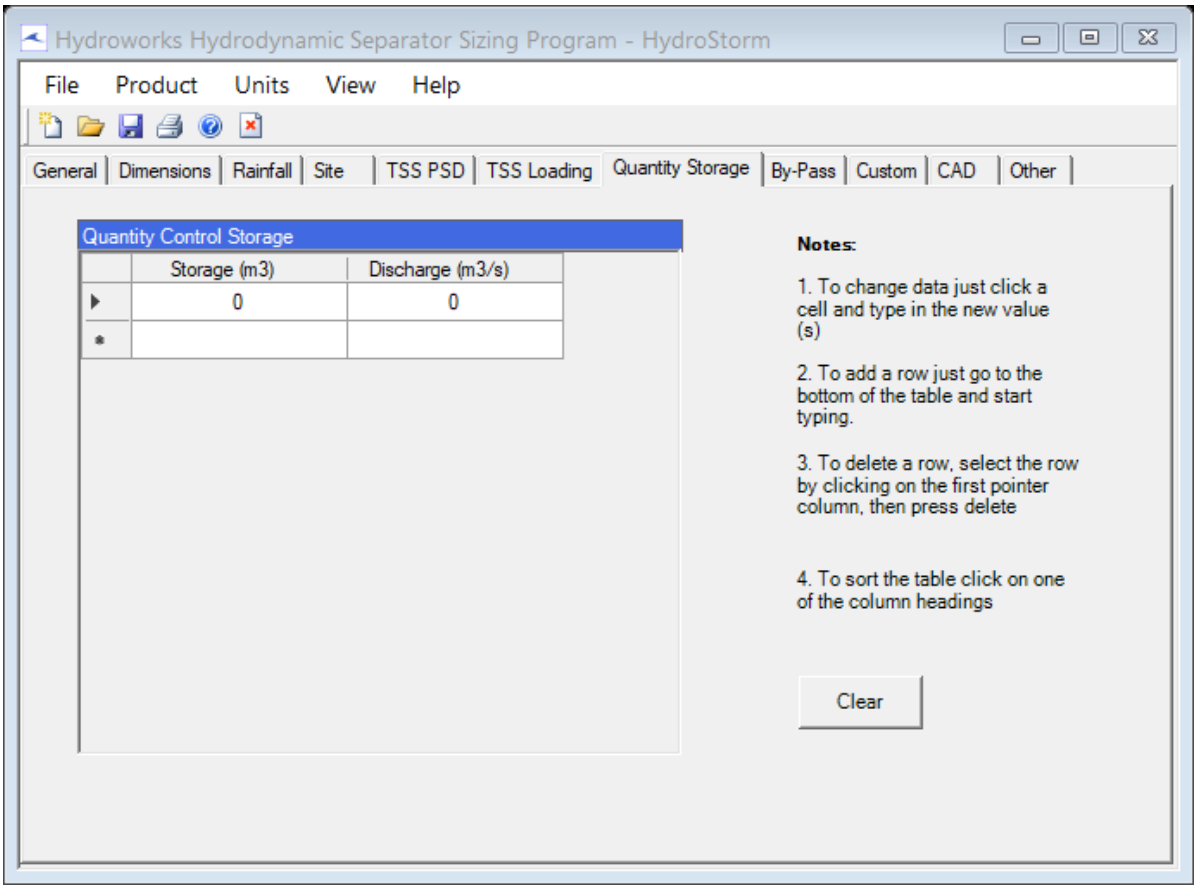
Generic HS 12 CAD Drawing



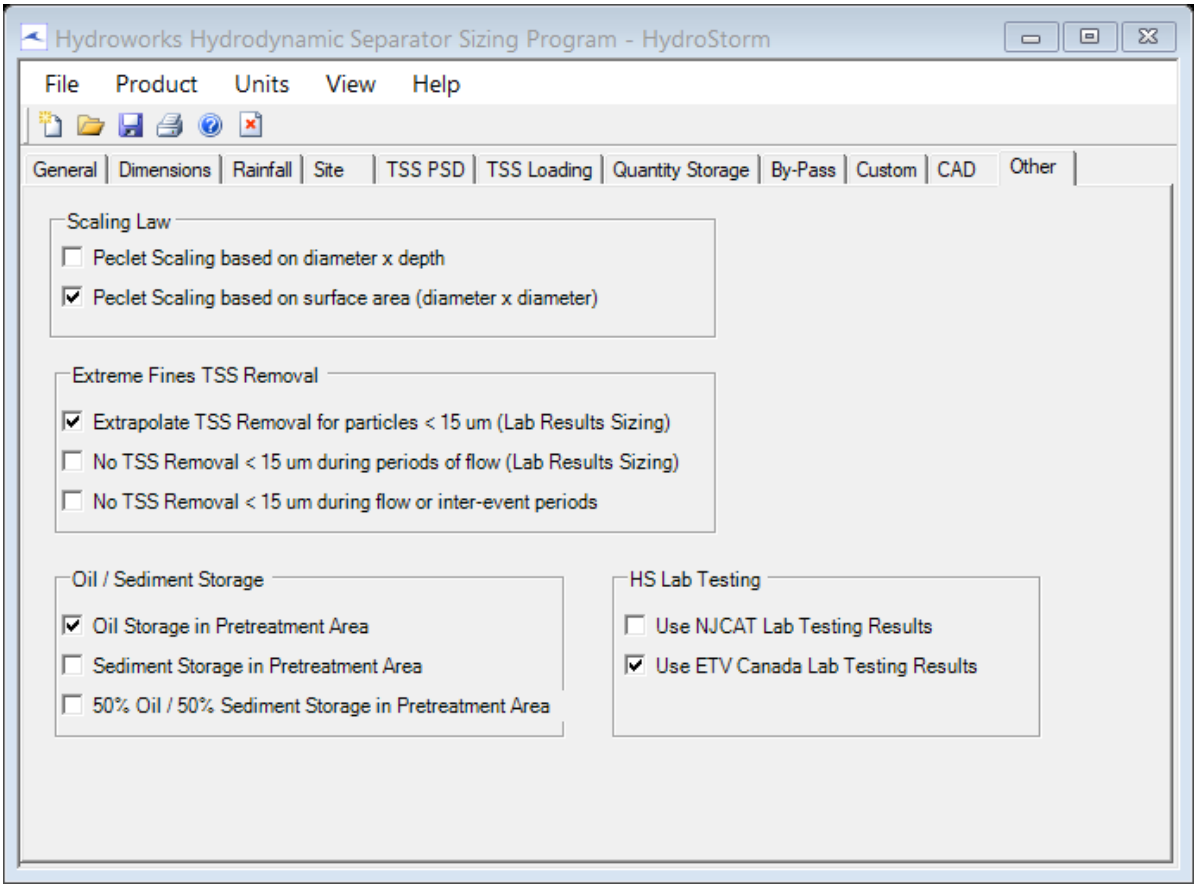
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Hydroworks Sizing Program - Version 5.0
Copyright Hydroworks, LLC, 2020

Hydroworks Sizing Summary

Farsight-MH 110, OGS 4
Stouffville, Ontario

04-08-2021

Recommended Size: HS 8

A HydroStorm HS 8 is recommended to provide 80 % annual TSS removal based on a drainage area of 2.21 (ha) with an imperviousness of 60 % and Toronto Central, Ontario rainfall for the City of Toronto particle size distribution.

The recommended HydroStorm HS 8 treats 99 % of the annual runoff and provides 80 % annual TSS removal for the Toronto Central rainfall records and City of Toronto particle size distribution.

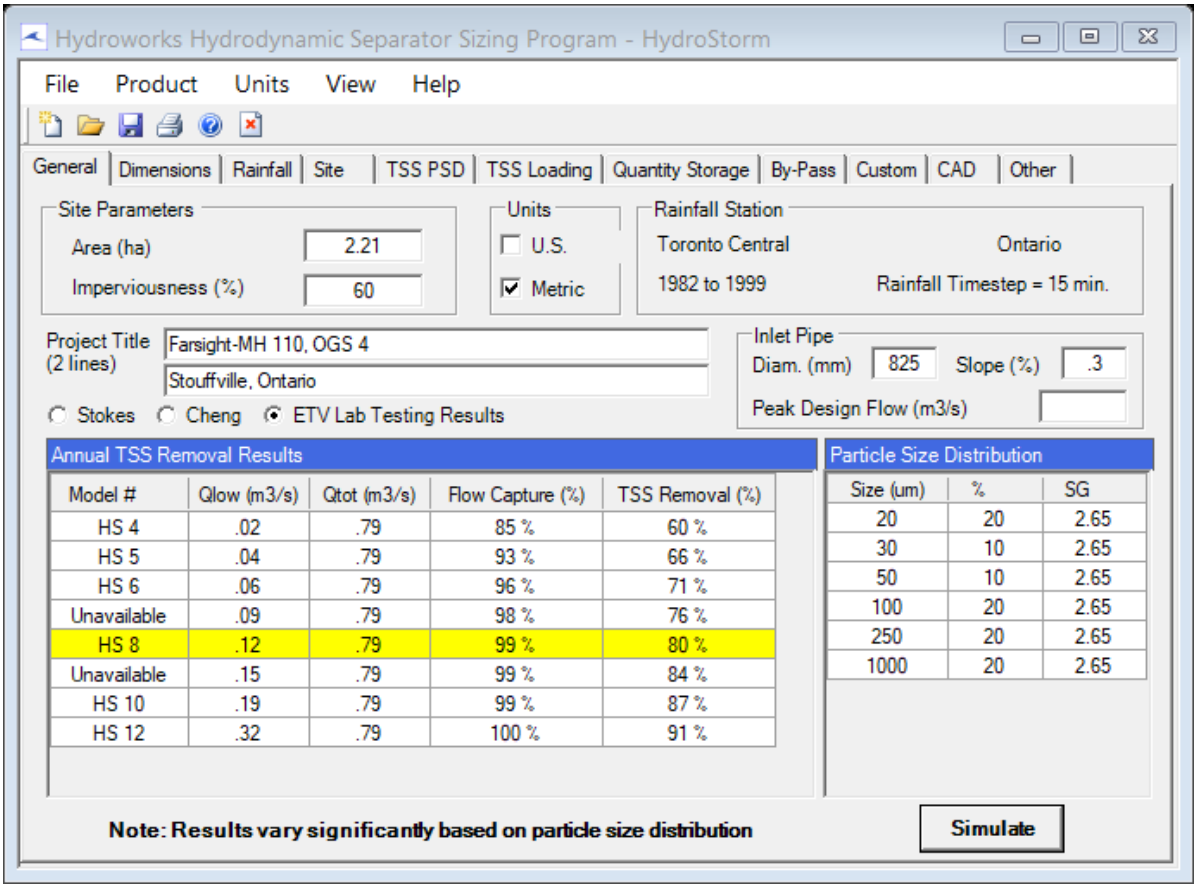
The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .79 (m3/s) for the given 825 (mm) pipe diameter at .3% slope. The headloss was calculated to be 115 (mm) based on a flow depth of 825 (mm) (full pipe flow).

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

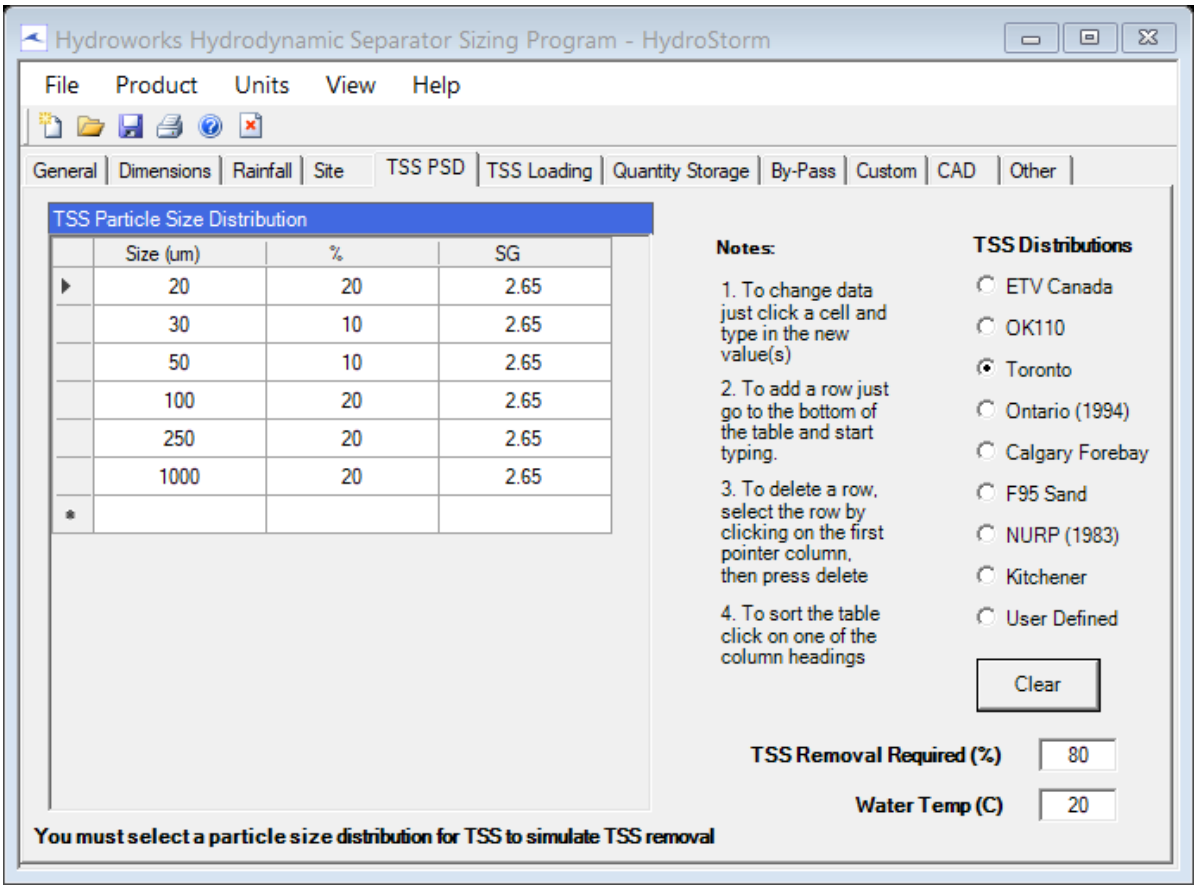
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroStorm . Design liability is only valid for lawsuits brought within the United States where Hydroworks has its corporate headquarters.

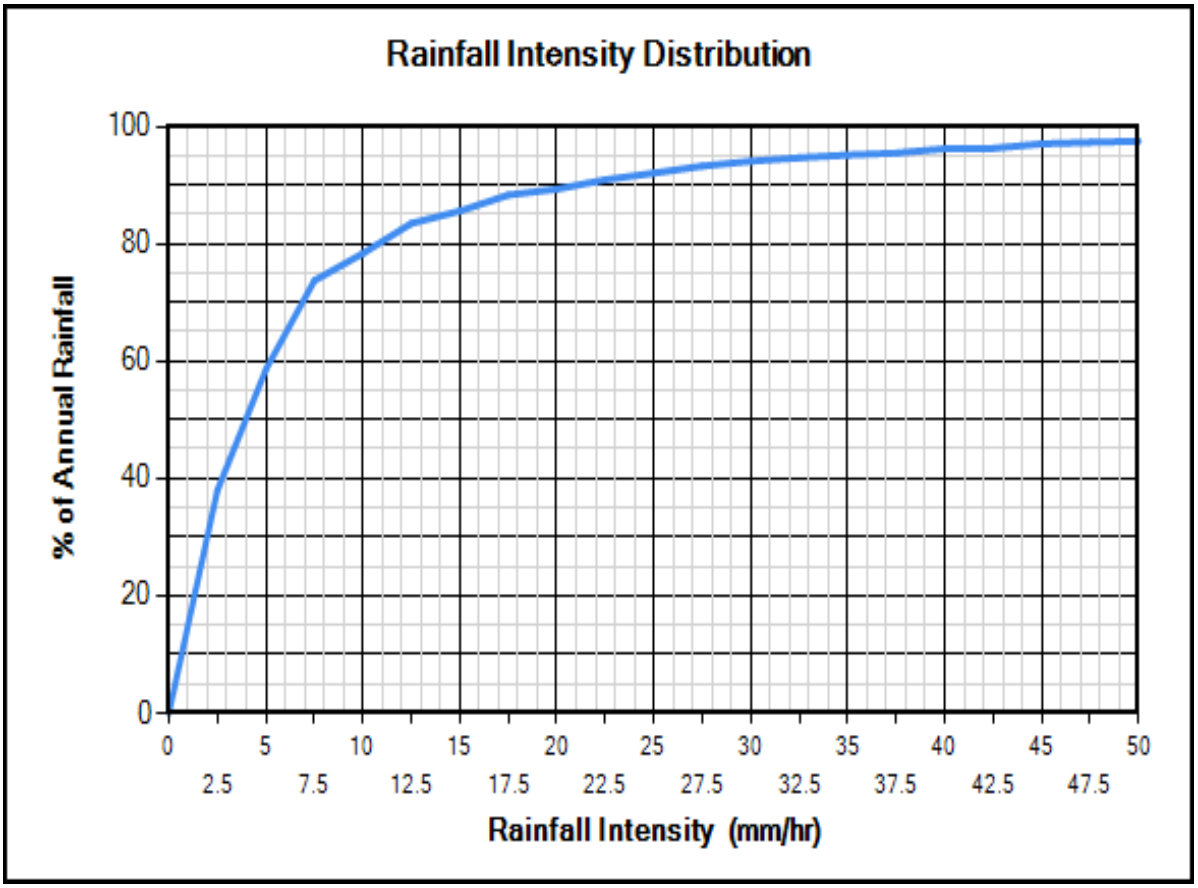
TSS Removal Sizing Summary



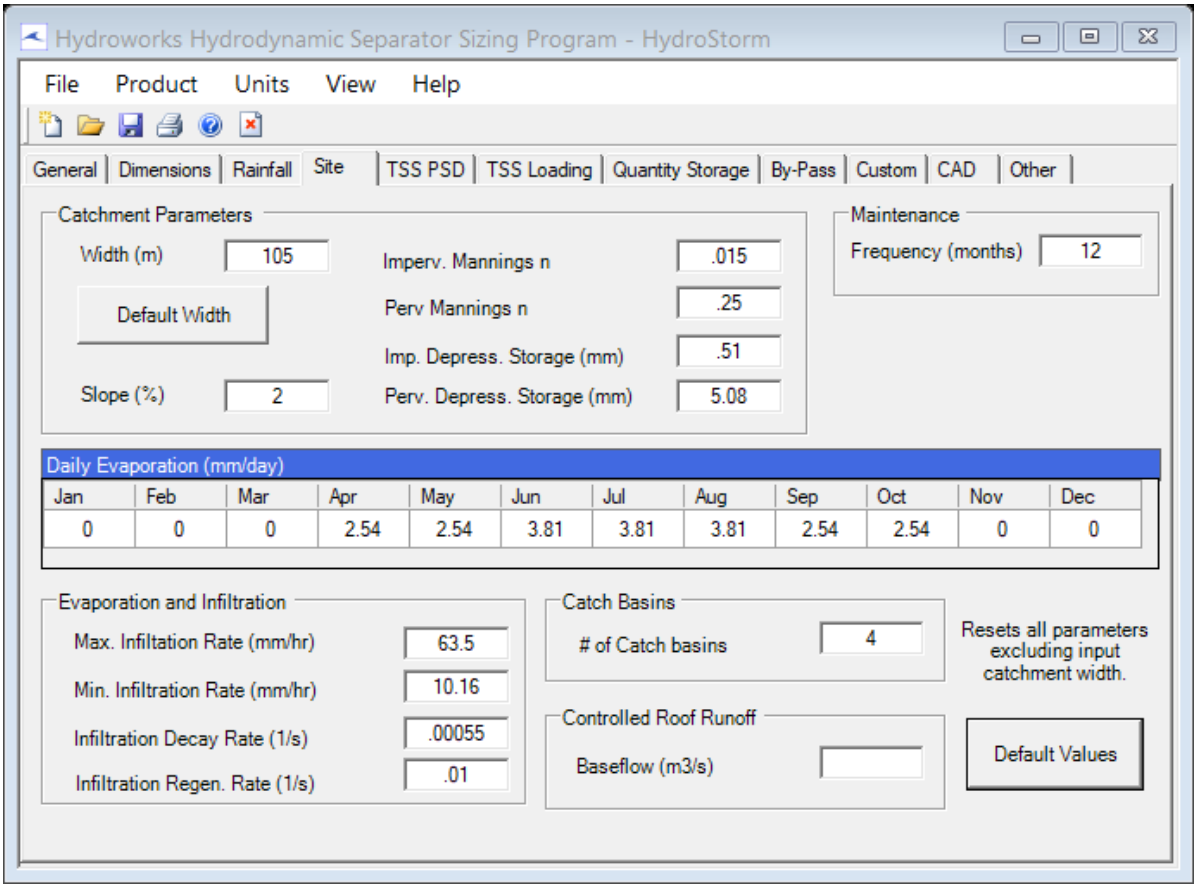
TSS Particle Size Distribution



Rainfall Station - Toronto Central, Ontario(1982 to 1999)



Site Physical Characteristics



Dimensions And Capacities

Hydroworks Hydrodynamic Separator Sizing Program - HydroStorm

File Product Units View Help

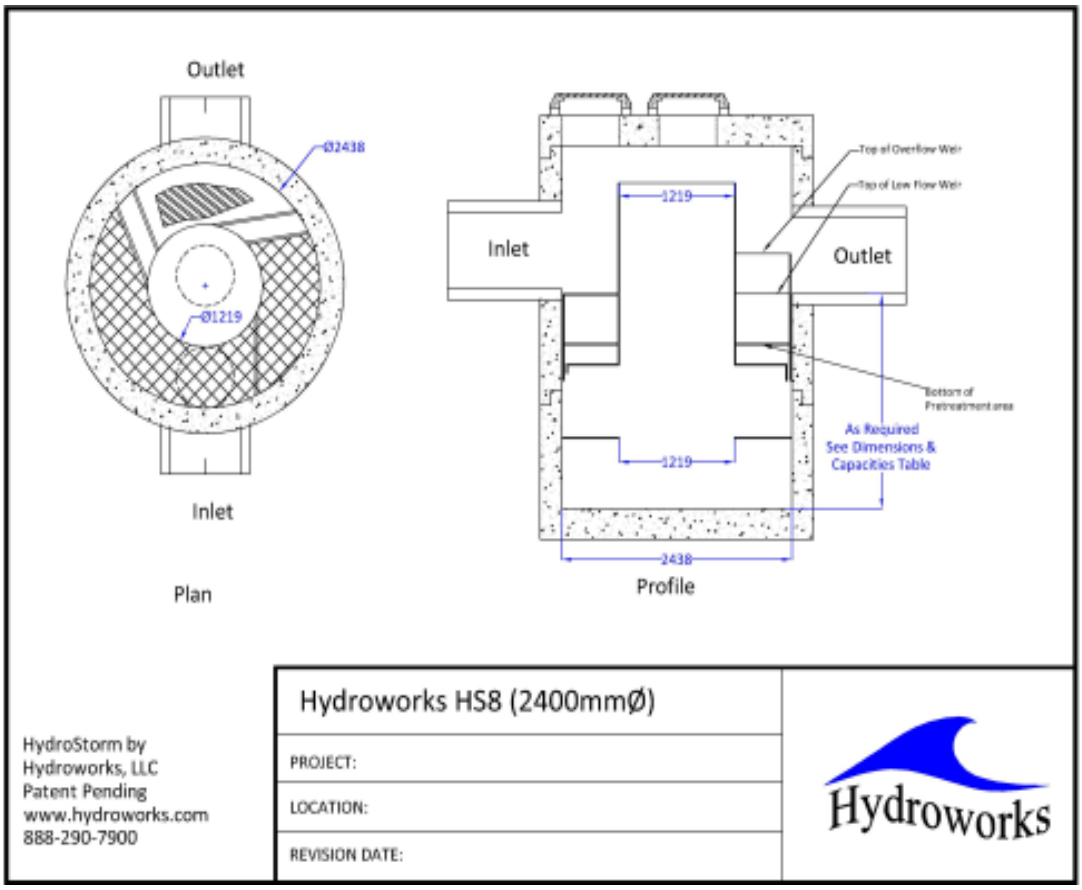
General | Dimensions | Rainfall | Site | TSS PSD | TSS Loading | Quantity Storage | By-Pass | Custom | CAD | Other

Dimensions and Capacities

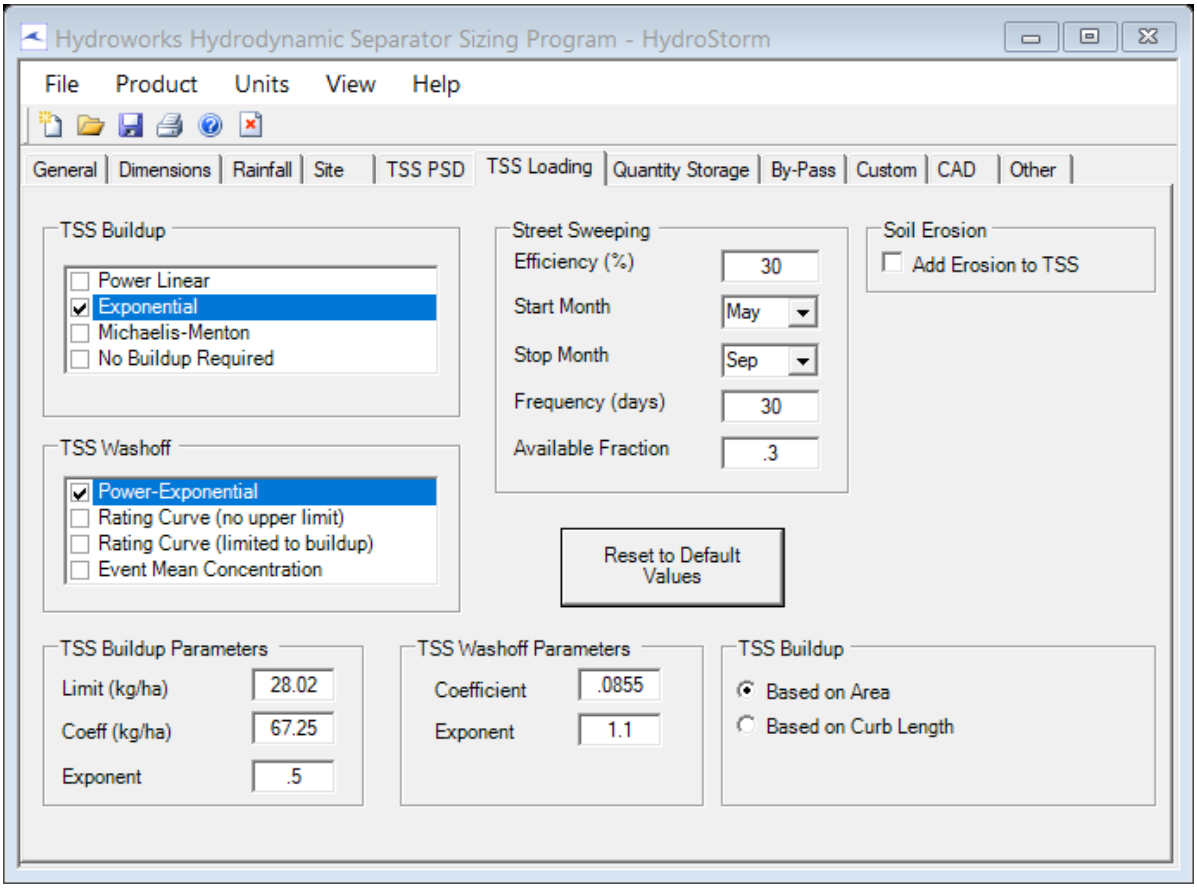
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	642	1.8	2.8
HS 6	1.83	1.83	1041	3.2	4.8
HS 7	2.13	1.98	1575	4.6	7.1
HS 8	2.44	2.13	2354	6.3	10
HS 9	2.74	2.44	3242	9.3	14.4
HS 10	3.05	2.74	4327	13.2	20
HS 12	3.66	3.35	7164	23.8	35.2

Depth = Depth from outlet invert to inside bottom of tank

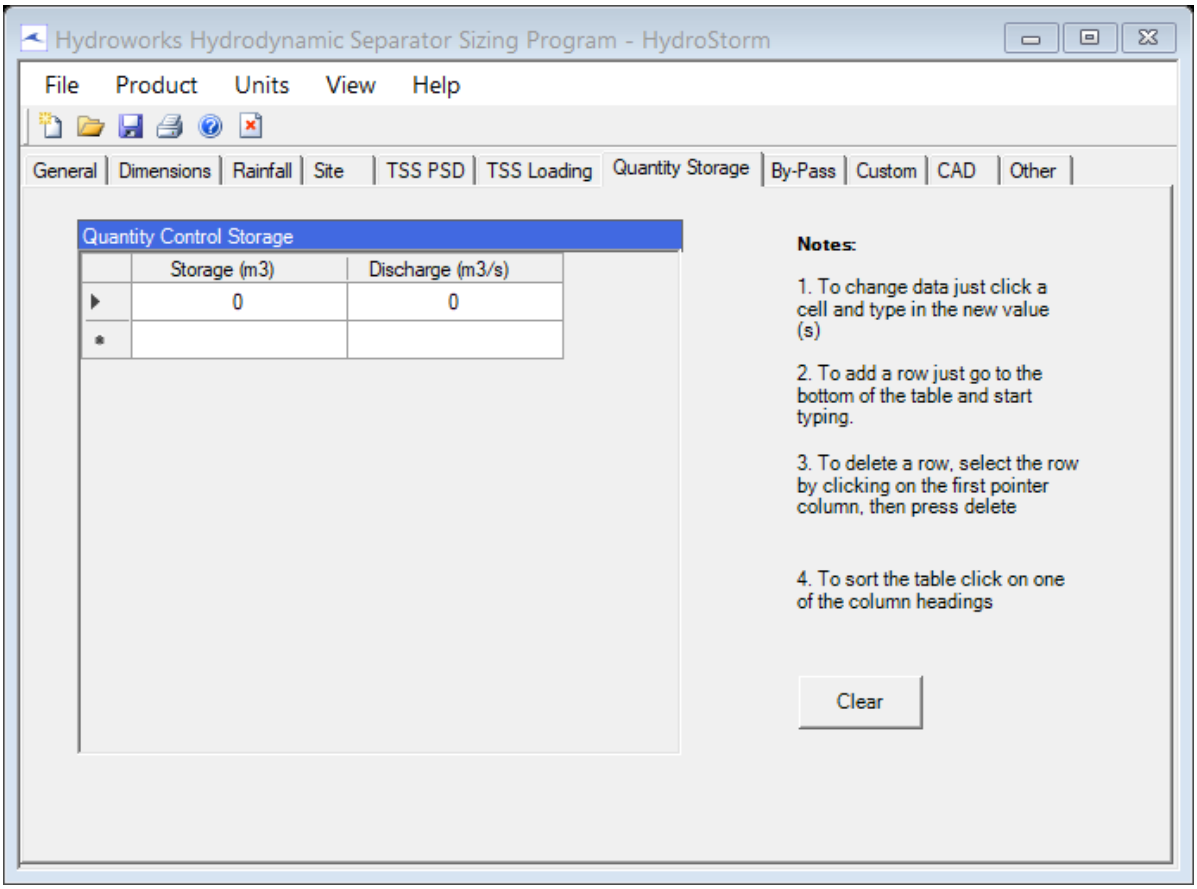
Generic HS 8 CAD Drawing



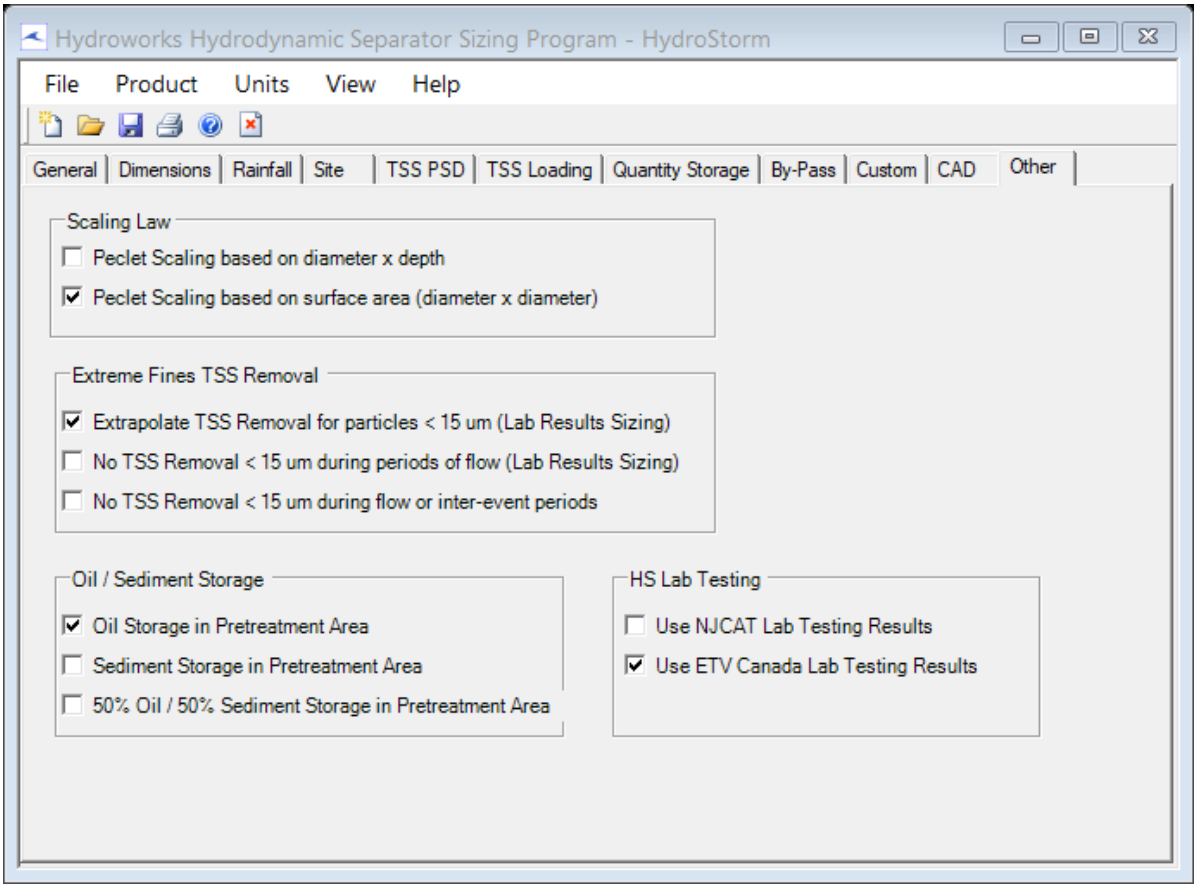
TSS Buildup And Washoff



Upstream Quantity Storage



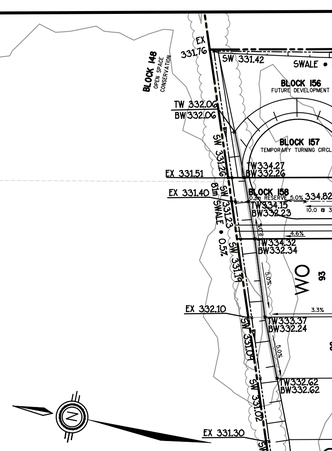
Other Parameters



Hydroworks Sizing Program - Version 5.0
Copyright Hydroworks, LLC, 2020

BACK POCKET FIGURES

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1



WALKWAY GRADING DETAIL
SCALE 1:250

LEGEND:

- PROPOSED CHANNEL REALIGNMENT
- 334.84 PROPOSED GRADE
- PROPOSED SLOPE 3:1 SLOPE (MAX)
- PROPOSED OVERLAND FLOW DIRECTION
- PROPOSED SWALE
- 333 ORIGINAL GROUND CONTOUR
- 329.00 PROPOSED GROUND CONTOUR
- LOT MAY REQUIRE SUMP PUMP SYSTEM TO STORM SEWERS
- SD SPLIT DRAINING LOT
- FD FRONT DRAINING LOT
- WO WALKOUT BASEMENT
- 227.34 PRELIMINARY UNDERSIDE OF FOOTING

SCALE 1:750

FARSIGHT HOMES
PRELIMINARY GRADING

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13286	3

191(W)-19.001

PLOT DATE: 8/22/2023 3:04 PM CAD FILE: P:\13\286\Drawing Files\Phase 1\Figure\3- 3rd FSSR submission\286_Fig 03 Prelim Grading.dwg

EAST LIMIT OF SUBDIVISION

NORTH LIMIT OF SUBDIVISION

WEST LIMIT OF SUBDIVISION

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

LAKESHORE ROAD

LIMIT OF 3.0m BUFFER

EXISTING WETLAND

EXISTING WOODLAND

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

LID 3
STORMTECH
GROUNDWATER ELEV: 329.21
GRANULAR INVERT: 330.21
CELL INVERT: 330.9
GROUND SURFACE: 333.16

LID 4
STORMTECH
GROUNDWATER ELEV: 328.79
GRANULAR INVERT: 329.79
CELL INVERT: 330.12
GROUND SURFACE: 332.26

LID 7
STORMTECH
GROUNDWATER ELEV: 328.68
GRANULAR INVERT: 329.68
CELL INVERT: 329.06
GROUND SURFACE: 332.08

LEGEND:

- 0.30 / 0.20 / 12.67 — AREA IN ha / RUNOFF COEFFICENT / TIME OF CONCENTRATION
- 0.75 / 0.60 — AREA IN ha / RUNOFF COEFFICENT
- OVERLAND FLOW ROUTE ARROW
- PROPOSED STORM SEWER SIZED FOR 100YR
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- PROPOSED STORM DRAINAGE AREA
- PROPOSED CHANNEL REALIGNMENT
- (SP) LOT MAY REQUIRE SUMP PUMP SYSTEM TO STORM SEWERS
- PROPOSED FLOODLINE
- EXISTING FLOODLINE

SCALE 1:750

BLOCK 151 CROSS SECTION
N.T.S.

FARSIGHT
PROPOSED STORM SERVICING

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	5

PLOT DATE: 6/29/2022 3:30 PM CAD FILE: P:\13-286\Drawing Files\Phase 1\Figure\13_286 F5PR submission086 Fig 05 Prelim Storm Servicing.dwg

191(W)-19.001

EAST LIMIT OF SUBDIVISION

NORTH LIMIT OF SUBDIVISION

WEST LIMIT OF SUBDIVISION

STREET E

STREET D

STREET A

STREET B

STREET C

LAKESHORE ROAD

MH 10A
TOP 333.55
N 328.86
SW 328.81

MH 9A
TOP 333.92
N 330.55
N DROP 329.32
W 329.37
S 329.29

MH 8A
TOP 334.68
N 330.11
S 331.09

MH 7A
TOP 334.19
S 329.83
N 329.83
E 329.75

MH 6A
TOP 334.33
N 329.96

MH 5A
TOP 334.61
N 330.40
S 330.38

MH 4A
TOP 334.65
NE 330.87
S 330.82

MH 3A
TOP 334.78
NE 330.99
SW 330.94

MH 2A
TOP 334.86
E 331.11
SW 331.06

MH 1A
TOP 335.45
W 331.73
N 331.66
S 331.64

MH 10A
TOP 333.55
N 328.86
SW 328.81

MH 11A
TOP 333.25
NE 328.73
SW 328.65

MH 12A
TOP 330.66
NE 328.48
W 328.40
W DROP 327.49

MH 120A
TOP 332.11
W 328.57
W DROP 327.16
E 327.16
S 327.08

MH 117A
TOP 334.79
NW 328.94
S 328.89

MH 116A
TOP 334.64
W 329.04
SE 328.99

MH 118A
TOP 334.65
S 330.52
S DROP 328.58
N 328.84
E 328.76

MH 119A
TOP 334.23
NW 331.08

MH 115A
TOP 334.34
W 329.38
S 329.97
S DROP 329.44
E 329.36

MH 114A
TOP 334.61
SW 329.58
E 329.53

MH 113A
TOP 334.80
SW 329.70
NE 329.68

MH 112A
TOP 335.00
S 330.72
S DROP 329.93
W 329.90
NE 329.85

MH 111A
TOP 334.43
N 331.23

MH 110A
TOP 334.59
W 330.23
E 330.18

MH 109A
TOP 334.67
S 330.44
N 330.44
E 330.36

MH 108A
TOP 334.71
N 331.44

MH 107A
TOP 334.35
N 331.01
S 330.99

MH 106A
TOP 334.78
E 331.46
S 331.38

MH 105A
TOP 335.22
W 332.18

PSMH
TOP 332.09
N 326.83

CROSSING DATA
STREAM ELEV 328.78
SAN TOP 327.25
CLEARANCE 1.50m

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

EXISTING DRAINAGE EASEMENT

EXISTING DRAINAGE EASEMENT

EXISTING DRAINAGE EASEMENT

PROPOSED LOCATION OF LOCAL SANITARY PUMPING STATION

LEGEND:

- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- FM — PROPOSED SANITARY FORCEMAIN
- 0.78 / 32 — AREA IN HECTARES / POPULATION
- SANITARY DRAINAGE BOUNDARY

SCALE 1:750

FARSIGHT HOMES
PROPOSED SANITARY SERVICING

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	6

191(W)-19.001

PLOT DATE: 4/18/2022 4:30 PM CAD FILE: P:\13\286\Drawing Files\Phase 1\Figure\13_3rd FSR submission\286 Fig 06-07 Farm Sanitary Servicing.dwg

LEGEND:

- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- FM — PROPOSED SANITARY FORCEMAIN
- SITE BOUNDARY

ACCESS ROAD

McFARLAND STREET

AURORA ROAD

LAKESHORE ROAD

EAST LIMIT OF SUBDIVISION

WEST LIMIT OF SUBDIVISION

STREET A

STREET B

STREET C

STREET D

STREET E

EXISTING DRAINAGE EASEMENT

PROPOSED LOCATION OF LOCAL SANITARY PUMPING STATION

CHANNEL DESIGN PREPARED BY GEO MORPHIX, REFER TO DRAWINGS GEO-1, GEO-2, DET-1

SCALE 1:1500

FARSIGHT HOMES
PROPOSED SANITARY OUTLET

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	7

19T(W)-19.001

PLOT DATE: 6/18/2020 4:20 PM USER: R.E. PATH: 286\Drawing Files\Plans\Figures\3_by ESSD submission\286 Fig 06-07 Pyatos Sanitary Servicing.dwg

EAST LIMIT OF SUBDIVISION

NORTH LIMIT OF SUBDIVISION

SOUTH LIMIT OF SUBDIVISION

STREET A

STREET B

STREET C

STREET D

STREET E

LAKESHORE ROAD

50ø WATERMAIN

200ø WATERMAIN

300ø WATERMAIN

EXISTING 300ø WATERMAIN

PROPOSED WATERMAIN TO CONNECT INTO EXISTING WATERMAIN ON LAKESHORE ROAD

CROSSING
RISE: 1.95m
SPAN: 14.64m
LENGTH: 14.0m

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

EXISTING WOODLAND

LEGEND:

- PROPOSED WATERMAIN
- PROPOSED VALVE & BOX
- PROPOSED HYDRANT & VALVE

SCALE 1:750

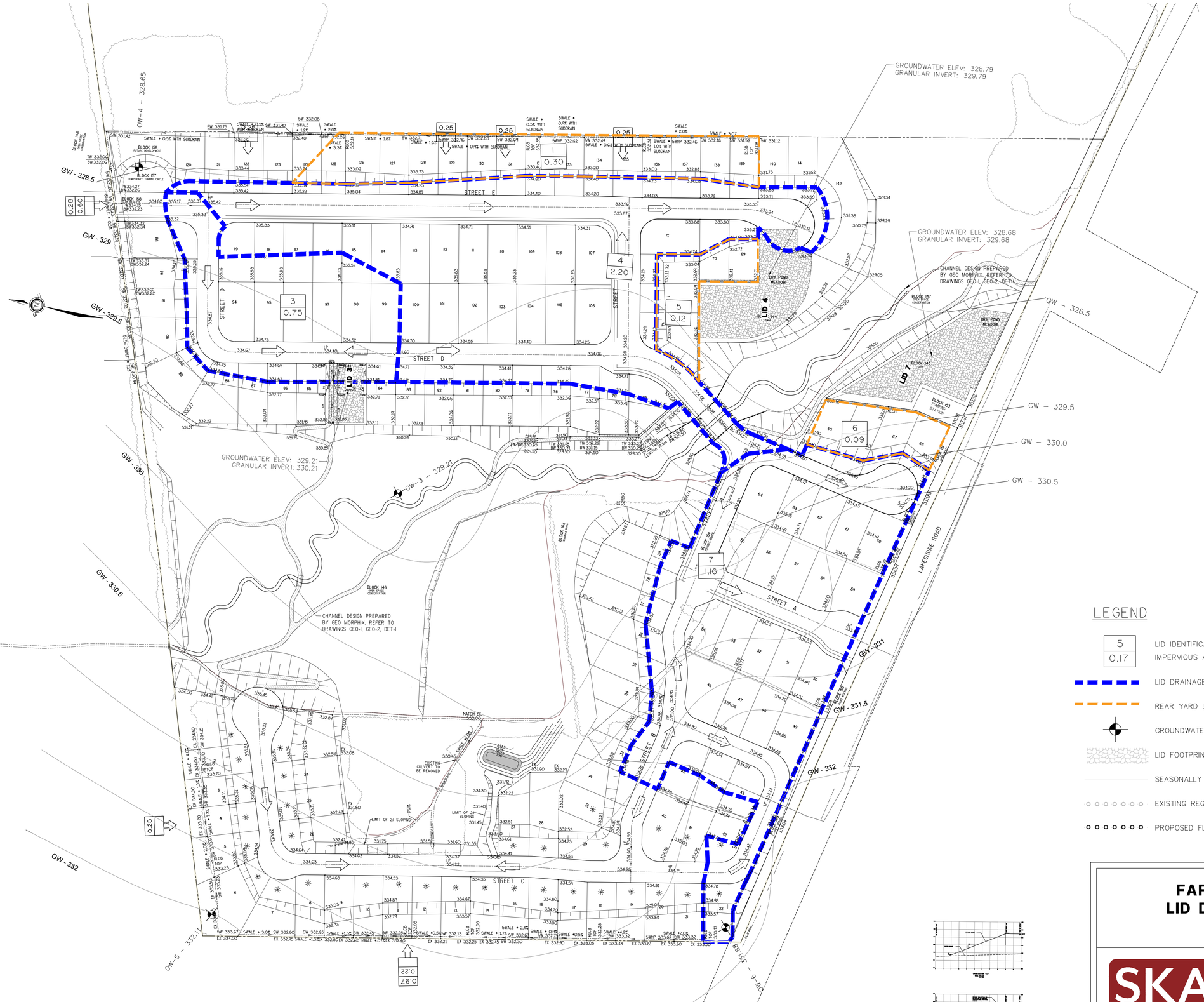
FARSIGHT HOMES
PROPOSED WATERMAN SERVICING

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	8

19T(W)-19.001

PLOT DATE: 4/8/2022 4:31 PM CAD FILE: P:\13\286\Drawing Files\Phase II\Figure\13- 3rd FSDR submission\286 Fig 08 Prelim WM.dwg


GROUNDWATER ELEV: 328.79
GRANULAR INVERT: 329.79
GROUNDWATER ELEV: 328.68
GRANULAR INVERT: 329.68
GROUNDWATER ELEV: 329.21
GRANULAR INVERT: 330.21
CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1
CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1
GW - 328.5
GW - 329
GW - 329.5
GW - 330
GW - 330.5
GW - 331
GW - 331.5
GW - 332
GW - 329.5
GW - 330.0
GW - 330.5
OW-4 - 328.65
OW-3 - 329.21
OW-5 - 332.11
OW-6 - 331.68
STREET A
STREET B
STREET C
STREET D
STREET E
LAKESHORE ROAD
LID 3
LID 4
LID 7
DRY POND MEADOW
BLOCK 146 OPEN SPACE CONSERVATION
BLOCK 147 OPEN SPACE CONSERVATION
BLOCK 153 FUTURE DEVELOPMENT
BLOCK 156 FUTURE DEVELOPMENT
BLOCK 157 TEMPORARY TURNING CIRCLE
BLOCK 158 FUTURE DEVELOPMENT
BLOCK 159 FUTURE DEVELOPMENT
BLOCK 160 FUTURE DEVELOPMENT
BLOCK 161 FUTURE DEVELOPMENT
BLOCK 162 FUTURE DEVELOPMENT
BLOCK 163 FUTURE DEVELOPMENT
BLOCK 164 FUTURE DEVELOPMENT
BLOCK 165 FUTURE DEVELOPMENT
BLOCK 166 FUTURE DEVELOPMENT
BLOCK 167 FUTURE DEVELOPMENT
BLOCK 168 FUTURE DEVELOPMENT
0.28 / 0.60
0.25
0.25
0.25
1 / 0.30
2 / 2.20
3 / 0.75
4 / 2.20
5 / 0.12
6 / 0.09
7 / 1.16
0.25
0.97 / 0.22
MATCH EX. 1350.00
EXISTING CULVERT TO BE REMOVED
LIMIT OF 2:1 SLOPING
LIMIT OF 2:1 SLOPING
SWALE • 0.5% WITH SUBDRAIN
SWALE • 1.0% WITH SUBDRAIN
SWALE • 1.25
SWALE • 2.0%
SWALE • 3.0%
SWALE • 1.8%
SWALE • 0.6% WITH SUBDRAIN
SWALE • 0.4% WITH SUBDRAIN
SWALE • 0.5% WITH SUBDRAIN
SWALE • 0.5% WITH SUBDRAIN
SWALE • 2.0%
SWALE • 3.0%
SWALE • 3.3%
SWALE • 2.0%
SWALE • 1.0%
SWALE • 2.45
SWALE • 0.4%
SWALE • 0.5%
SWALE • 4.25
SWALE • 2.0%
SWALE • 3.0%
SWALE • 1.37
SWALE • 0.75
SWALE • 0.5%
SWALE • 0.72%
SWALE • 1.38%
SWALE • 2.0%
SWALE • 3.0%
SWALE • 1.38%
SWALE • 0.72%
SWALE • 0.5%
SWALE • 0.75

PROPERTY LINE

LIMIT OF DEVELOPMENT

207
1.43
20%

204
2.91
57%

210
0.08
60%

203
0.75
87%

STORMTECH 4
GROUNDWATER ELEV: 328.79
GRANULAR INVERT: 329.79
CELL INVERT: 330.15
GROUND SURFACE: 332.16

STM HW3
INV 329.97

STORMTECH 7
GROUNDWATER ELEV: 328.68
GRANULAR INVERT: 329.68
CELL INVERT: 330.09
GROUND SURFACE: 332.08

STM HW1
INV 329.99

STM HW2
INV 330.70

STORMTECH 3
GROUNDWATER ELEV: 329.21
GRANULAR INVERT: 330.21
CELL INVERT: 331.18
GROUND SURFACE: 333.16

CROSSING
RISE: 1.60m
SPAN: 14.94m
LENGTH: 14.0m

205
16.11
-

EXISTING WOODLAND

202
2.20
52%

LAKESHORE ROAD

STM HW4
INV 330.50

EXISTING WOODLAND

STM HW5
INV 331.91

208
0.27
-

0.97
0.22

201
1.75
59%

BOX STORAGE PIPE
1800x900mm

STREET A
STREET B
STREET C
STREET E
STREET F
STREET G
STREET H
STREET J
STREET K

LEGEND:

- POST DEVELOPMENT DRAINAGE BOUNDARY
- OVERLAND FLOW ROUTE
- 202 / 2.51 / 53% — SUBCATCHMENT ID, SUBCATCHMENT AREA (HA), PERCENT IMPERVIOUS
- PROPOSED STORM SEWER
- PROPOSED 100-YR STORM SEWER
- PROPOSED REGIONAL FLOODLINE
- INFILTRATION GALLERY

SCALE 1:1250

FARSIGHT HOMES
PROPOSED DRAINAGE CONDITIONS

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	12

PLOT DATE: 1/20/2022 3:08 PM CAD FILE: P:\13\286\Drawing Files\Phase 1\Figure\13_3xx f1508 submission\286 Fig 04 - 02 Post Development v2.dwg

AGRICULTURAL

3108.60
331.68

3108.75
331.71

3108.5
331.61

3108.3
331.44

3108.25
331.18

3108
331.02

3107.75
330.87

3107.5
330.84

3107.45
330.57

3107.4
330.43

3107.3
330.36

3107.2
330.27

3107
330.19

3106.75
330.08

3106.5
330.01

3106.4
330.03

3106
330.03

LIMIT OF 15m BUFFER

EXISTING WOODLAND

EXISTING WOODLAND

EXISTING WOODLAND

LEGEND:

EXISTING REGIONAL FLOODLINE

HEC-RAS STATION
EXISTING REGIONAL WATER SURFACE ELEVATION
3107.2
330.11

HEC-RAS CROSS SECTION LOCATION

SCALE 1:1000

FARSIGHT HOMES
EXISTING REGIONAL FLOODPLAIN

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	13

PLOT DATE: 4/21/2022 10:22 AM CAD FILE: P:\13\286\Drawing Files\Phase 1\Figure13_3rd FARR submission\286 Fig 13-5 Floodline Storage (Existing).dwg

3108.60
332.33

3108.75
332.33

3108.5
331.81

3108.3
331.52

3108.25
331.34

3108
331.34

3107.75
331.33

3107.5
331.32

3107.45
331.30

3107.4
331.23

3107.3
330.49

3107
330.43

3106.75
330.13

3106.5
329.79

3106.4
329.24

3106
329.23

3107.2
330.50

AGRICULTURAL

EXISTING WOODLAND

EXISTING WOODLAND

EXISTING CULVERT TO BE REMOVED

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

CHANNEL DESIGN PREPARED BY GEO MORPHIX. REFER TO DRAWINGS GEO-1, GEO-2, DET-1

LIMIT OF 2:1 SLOPING

LIMIT OF 2:1 SLOPING

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

BLOCK 146 OPEN SPACE CONSERVATION

BLOCK 147 OPEN SPACE CONSERVATION

BLOCK 148 OPEN SPACE CONSERVATION

BLOCK 149 OPEN SPACE CONSERVATION

BLOCK 150 OPEN SPACE CONSERVATION

BLOCK 151 OPEN SPACE CONSERVATION

BLOCK 152 OPEN SPACE CONSERVATION

BLOCK 153 PUMPING STATION

BLOCK 154 OPEN SPACE CONSERVATION

BLOCK 155 FUTURE DEVELOPMENT

BLOCK 156 FUTURE DEVELOPMENT

BLOCK 157 TEMPORARY TURNING CIRCLE

BLOCK 158 OPEN SPACE CONSERVATION

DRY POND/OGS MEADOW

DRY POND/OGS MEADOW

DRY POND/OGS MEADOW

TOP OF BLUFF

TOP OF BLUFF

MATCH EX 330.66

MAJOR LAKESHORE ROAD

MAJOR LAKESHORE ROAD

SCALE 1:1000

LEGEND:

PROPOSED FLOODPLAIN

HEC-RAS STATION
PROPOSED REGIONAL WATER SURFACE ELEVATION
3107.2
330.11

HEC-RAS CROSS SECTION LOCATION

FARSIGHT HOMES
PROPOSED REGIONAL FLOODPLAIN

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NUMBER
13:286	14

PLOT DATE: 4/29/2022 @ 2:29 PM USER: P.FE. P:\13\286\Drawing Files\Plans n\Figure13_fpl 550 samson\286 Fig 13-5 Floodplain Storage Refinement.dwg